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ABSTRACT

The different educational uses of cable television as well as the methods and problems of that use are described in a state of the art review. The Federal Communications Commission regulations and related franchise activity are described, and the methods of using the educational channel as open or closed circuit TV or pay TV are indicated for different types of students, the community, the school, and general information needs. Technical and economic considerations are discussed as well as obstacles to the use of cable. Funding problems are also treated. The appendixes contain discussions of television markets, innovative educational uses of cable television, equipment, schools, and programs. (WH)

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PREFACE

This document was prepared by the Cable Television Information Center under grants from the Ford Foundation and the John and Mary R. Markle Foundation to The Urban Institute.

The primary function of the center's publications program is to provide policy makers in local and state governments with the information and analytical tools required to arrive at optimum policies and procedures for the development of cable television in the public interest.

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The center is indebted to Robert Unger, Branch Chief, Certificates of Compliance Division, Federal Communications Commission Cable Television Bureau; Dr. Robert Fina, Director of Television Services, and Dr. Robert Brumbaugh, Director of Research and Curriculum, Kutztown State College, Kutztown, Pennsylvania; and William Kline, Instructional Media Coordinator, Instructional Media Services Offices, Governor Mifflin Schools, Shillington, Pennsylvania.

INTRODUCTION

In February 1972, the Federal Communications Commission issued its cable television Report and Order. Among the rules contained in that document was one which stated that "Each system [located in whole or in part within a major market area] shall maintain one specially designated channel for use by local educational authorities."[1]

While the designated channel for cable TV systems within the 100 major markets[2] is somewhat less than the designated channel capacity recommended by some educational groups,[3] the mere assignment of a local educational access channel was an important step on the part of the commission. This provision represents a recognition of the fact that local educational communications needs are not completely met by broadcast educational TV stations[4] and that local educational authorities should be given the opportunity to meet their own communities' requirements. Thus, many localities now have or soon will have at their disposal a conduit capable

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1. Cable Television Report and Order, 47 C.F.R. 76.251 (a)(5).
2. See Appendix A.
3. Joint Council on Educational Telecommunications (JCET), for example, asked that 20% of system capacity in all markets be made available for educational and noncommercial use.
4. The FCC's rules also require that cable systems retransmit the signals of proximate broadcast ETV stations.

of transmitting video material tailored to the specific educational requirements of their own communities.[5]

There are many reasons why local educators might want to take advantage of that conduit. When used to interconnect schools--particularly those schools wired for closed circuit television--cable technology can have great influence in the classroom, permitting the specialized facilities of any single school to be shared throughout the system, extending the range of particularly effective teachers and allowing more efficient use of prerecorded materials.

Perhaps more importantly, cable TV permits educators to reach people who are not in school. Adult education programs can be transmitted directly to the home or to neighborhood learning centers. Material preparing the student to take high school or college equivalency tests can be cablecast. On-the-job training is possible. Preschool programming can include video Headstart programs, or can even reduce the "culture shock" of first attendance in kindergarten by introducing ongoing classes to the prospective entrants. Dropouts can be reached. The homebound can be taught.

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5. The Cabinet Committee on Cable Communications in its 1974 Report to the President (Washington, D.C.: U.S. Government Printing Office, 1974) recommends that the FCC immediately and local franchising authorities eventually be prohibited from requiring educational access channels. There is some doubt as to whether the Committee's recommendations will be implemented. However, even if they are, other channels will be available on a leased basis. It is extremely unlikely that fees charged for channel lease will be sufficiently high to discourage educational access.

Offerings on the educational access channel can be made available to a variety of students. Beyond that, use of the channel can be made available to an assortment of educators. The channel can be programmed not only by the public schools but by community colleges and universities. The "nonformal" educators--those who run "free schools" or teach Saturday morning Hispanic culture classes, for instance--might use the cable system to reach wider audiences.

The FCC has stated that each educational channel will have a developmental period extending from the time subscriber service is inaugurated until five years after the completion of the cable system's basic trunk line.[6] This period, if used to test the diversity of uses and users, could be a first step toward extensive educational use of cable systems.

This report will discuss implications of the FCC's rules on local franchise provisions, will explore some of the possible uses of the educational channel, and will consider factors contributing to decisions of whether and how to use it.

Discussion of the interactive teaching potential of cable will be confined to some of the Appendix[7] material since, despite the

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6. Cable Television Report and Order, 36 FCC 2d 141, 191 (1972).
7. See Appendix B.

1972 FCC requirement that all new systems have two-way capacity,[8] actual use of interactive terminals will not be realized to a significant extent for some years to come.[9]

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8. A cable TV system with two-way capacity can, when activated, conduct signals to the headend as well as away from it.

9. For a full report on the range of two-way cable applications, see The Uses of Cable Communications (Washington, D.C.: Cable Television Information Center, 1973).

FEDERAL COMMUNICATIONS COMMISSION REGULATIONS AND FRANCHISE CONSIDERATIONS

The FCC requires an educational access channel only for those areas located in whole or in part within the 35 mile zones surrounding the one hundred major television markets.[10] Franchising authorities outside those markets must either ensure the channel as a term of the franchise[11] or else trust to the goodwill of the cable operator either to donate an educational channel or to provide time on the system's own local origination channel. Educational authorities within the major markets, but in localities with systems constructed prior to the issuance of the 1972 cable television rules, may have to wait until the system expands its channel capacity to get the designated channel. Those outside the major markets, but in localities which possess a system with no available channels, may not be able to get a designated channel until the existing franchise agreement expires.

Local educational authorities"

In its regulations, the FCC stipulated that the educational access channel was to be for use by "local educational authorities." The commission did not define a "local educational authority." From the time that the cable television rules were released by the

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10. See Appendix A.

11. Franchises for systems in areas outside the major markets may require provision of an educational access channel, but if they do the channel must be available on the same basis as that specified for major markets by the FCC. 47 C.F.R. 76.251(b).

FCC in February until its clarification[12] was issued in April 1974, some franchising authorities as well as some public school officials assumed that the educational access channels were for the sole use of the public school systems. In the Clarification the commission explained its intent, saying:

> Our concept of "educational authority" was not meant to restrict the use of this channel to the local public school board. Any school, college, or university, public or private, formal or informal, should have the opportunity to air programming on this channel. The one exception to this interpretation would be commercial educational enterprises (computer schools, beauty schools, etc.) that would in essence be using the channel for advertising which we have specifically disallowed on the educational access channel. Any bona fide educational interest should have access to the educational channel. We envision a working educational channel as one where the programmers work out a reasonable schedule among themselves and with the cable operator to utilize this opportunity offered to them. It might be possible, for instance, for a high school and a college to produce complementary instructional programming of benefit to both. It is not the cable operator's responsibility to program this channel nor should he be expected to.[13]

While the Clarification specifically states that an "educational authority" is something more than the established school system, some ambiguity still exists in that it is still not clear what a "bona fide educational interest" is. Does the term, for instance, include the educational divisions of labor unions, the "Y"s or local religious organizations?

Nor does the FCC offer any guidelines as to who is responsible for designating the "local educational authorities." In the absence

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12. Clarification of the Cable Television Rules and Notice of Proposed Rulemaking and Inquiry, FCC Docket Nos. 20018-20024, 46 FCC 2d 175 (April 24, 1974).
13. Clarification, paragraph 30.

of guidelines some local officials have assumed that responsibility. Boulder, Colorado, for instance, has assigned use of the channel to "any institution of the Boulder Valley Public School system, any non-profit day care center, and any other non-profit educational institution."[14] The matter is, in any event, one that should not be resolved without close scrutiny of the community's needs and resources.[15]

The regulations contain another ambiguity insofar as channel management is concerned. The FCC's rules state that "Except on specific authorization...no local entity [other than the cable system] shall prescribe any other rules concerning the number or manner of operation of access channels...."[16] The operating rules are those that govern the medium through which programming is presented (videotape, cassettes, film, live, etc.); how time is scheduled; and other administrative matters. These operating rules would seem to be the responsibility of the cable operator. It is possible that the franchising authority might request and receive "specific authorization" from the commission to establish operating rules. To date, no such authorization has been given. Also, the cable

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14. The Boulder Cable Communications Experience: Negotiation Process and Permit Ordinance (Boulder, Colorado: University of Colorado, 1973), p. 7.

15. In order to be valid, local franchises must be certified by the FCC. Thus far, it has not certified any franchises containing definitions of "local educational authorities," nor have any franchises been denied certification on those grounds. It is conceivable that an "educator" denied access to the channel might appeal to the commission.

16. 47 C.F.R. 76.251 (a)(11)(iv).

operator may be able to assign administrative duties--although not the legal responsibility--to some other party. In the absence of guidelines or precedents, the franchising unit, the educational authorities and the cable operator should come to a cooperative agreement regarding channel management.

PRE-FRANCHISE ACTIVITY

The educational authorities in localities which are in the pre-franchise stage of cable development have many more options and opportunities than do those in localities which have already been wired. It is in the franchise negotiations that "horse trading" takes place.[17] Because the educational community has a vital stake in the shape of its local communications system, educators should take part in those negotiations and should enter into them armed with a comprehensive plan.

Number of educational access channels

The FCC has placed certain restrictions on what is automatically of granted to the educators. As cited above, without specific authorization, the franchising authority may not require that more than one educational access channel be provided. This does not mean that educators are now and will forever be confined to a single no-cost cable channel. The FCC has retained the right to authorize more free channels on a case-by-case basis and may very well do so if

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17. For a general guide to franchising procedures, see A Suggested Procedure: An Approach to Local Authorization of Cable Television (Washington, D.C.: Cable Television Information Center, 1972).

the community can show that the need exists and can present a use plan.

The commission has, in fact, demonstrated some flexibility in the matter of access channels. Theta Cable of California holds the franchises in Ontario, Upland, parts of San Bernadino County and the town of Montclair, California. All of these localities are within the Los Angeles TV market. The FCC approved franchises which provided four educational channels, one local government access channel each for the franchising units and one public access channel to serve jointly all of the communities involved. In granting the certificates of compliance, the commission expressed its reluctance to substitute its judgment for that of the localities.[18]

The franchise above stipulates a rearrangement of the access channels required by the FCC. It does not require more such channels. At this time, the commission has approved no franchise requiring more access channels than its regulations require. Yet neither has it denied any franchise for that reason. The explanation of this "no action" situation is simply that there is a tremendous backlog of certificate applications at the FCC's Cable Television Bureau and, in order to process the applications as quickly as possible, those applications which do not require special treatment are being processed first.

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18. For a fuller discussion of the Theta Cable award, see ICET News, Vol. V, No. 8, August 1973, pp. 7-8. See also Clarification, paragraph 15.

The commission's Cable Bureau chief said, on August 11, 1972, in response to an inquiry from Western Communications, Inc.:

> Where variances are sought as for instance where a franchise calls for extra access channels, greater channel capacity, or a higher franchise fee, detailed showings will be required during the certification process. If such a showing is inadequate, the Commission will not issue a certificate of compliance.[19]

Thus, there is reason to believe that certification will be granted only if need for more channel space is demonstrated and a well thought out use plan is presented. Certification may be slowed (although the backlog is being steadily reduced); but if the extra channels are needed, they will be worth waiting for.

"Discount" rates

It may also be possible to lease additional channel space from the cable operator at "discount" rates.[20] This may be done in two different ways. First, a preferential rate provision may be written into the franchise; however, since the commission's rules prohibit such provisions without specific permission,[21] a waiver of the FCC rule would have to be sought in the certification process. Alternatively, the preferential rate may be sought via negotiation with the cable operator after the franchise is awarded. The same restrictions apply to systems outside the major market areas where discount

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19. Letter from Sol Schildhause, chief of Cable Television Bureau of the Federal Communications Commission, to Edward Allen, Western Communications, Inc., August 11, 1972.

20. The Natrona County (Wyoming) Library, for instance, leases a channel for $1 per year. While that price is tantamount to providing a free channel, it should be possible to arrive at some reasonable figure between $1 per year and the going commercial rates.

21. Reconsideration of Cable Television Report and Order, 36 FCC 2d 326, 356.

leased channels are considered.

In the April 1974 clarification of the FCC cable regulations, the commission encouraged market place experimentation with preferential rates.[22] [23] Thus, educational authorities may--and probably should--negotiate with the cable operator after the franchise award for a "discount" leased channel if the extra capacity is needed. The results of the negotiation should be incorporated in a separate agreement. It should be stressed that preferential rate provisions imposed before franchise award will be considered conditions of the franchise and will require a waiver, regardless of whether the provision is in the franchise or is embodied in a separate agreement. However, if negotiations are commenced after the award, the "market place experimentation" that the commission encouraged will be taking place, and no special FCC authorization will be necessary.

Other franchise provisions

Apart from the question of additional educational channels, the configuration, capacity and capability of the system will affect the communications options open to the educational community.[24]

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22. Clarification, paragraph 35.
23. It is also interesting to note that the Cabinet Committee on Cable Communications' Report to the President states that "The interest of governmental, non-commercial, and nonprofit entities in low cost access to cable channels will be served adequately through access to cable channels through the operation of [a] variable charge, leased channel rate." (p. 31).
24. For the recommendations of the National Education Association, see Cable Television, Franchise Provisions for Schools (Washington, D.C.: NEA, 1973).

Channel capacity

The FCC requires that systems located in the major markets have at least a 20 channel capacity. Outside of the major markets, such a requirement must be written into the franchise if it is desired. If it is economically possible--and in most cases it is--that requirement should be included. Particularly in view of the projected operation of communications satellites--with their promise of more educational and cultural programming--it is vital that educators help ensure that cable systems have sufficient channel capacity.

Production facilities

Options for sharing production facilities abound. Studios, cameras, videotape equipment, and other gear can often be shared by several users of the cable system. A survey of local resources should be undertaken before deciding whether specific production facilities ought to be purchased by the schools or included as a franchise requirement. In practice, the local franchising authority may require that the system build and maintain such production facilities as are economically feasible for that locality. However, if production facilities provided by the cable operator are for the sole use of a particular group, such as a studio for use by the high school, the FCC may permit the operator to deduct the cost from the franchise fee.[25] Costs incurred for the development of the system as a whole, such as a shared local origination studio, are the financial responsibility of the operator.

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25. In its Clarification, the FCC reinforced this likelihood by stating "Cable subscribers are being asked to subsidize the local school system, government, and access groups. This was not our intent...." (paragraph 18). See also paragraphs 108ff.

"Drops" and wiring

It is not uncommon that the cable system provide "drops"--cable connections from the distribution system to buildings--connecting all schools and libraries within reasonable distance. In addition, systems have often provided at cost whatever other wiring is desirable in these buildings, either internally or externally.

Two-way capacity

The FCC requires that all systems in major markets have interactive (two-way)[26] capacity. That capacity should also be included, if possible, in systems outside the major markets. "Capacity" does not mean that a two-way video system will be operational. It simply means that the system will be able to accept the two-way hardware when and if it is installed.

Interconnection

Educational authorities should also investigate the possibility[27] that the schools be interconnected with each other, with the cable system's headend and, when possible, with neighboring school districts. Whether this is paid for completely by the cable system or done at cost by the system should be dictated by local economic realities.

The cable system may also be required by the ordinance to have an ITFS[28] receiver and equipment to adapt the signal for home

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26. That is, a signal can be sent not only from the central distribution point to the subscriber but can go from some or all subscribers to a point or points in the system, i.e., computer to computer, student to teacher, traffic intersection to police monitor.
27. See page 51.
28. Instructional Television Fixed Service (ITFS) is a microwave frequency which has been designated by the FCC for educational use.

receivers. Using cable in connection with ITFS would provide: 1) an inexpensive return link from the school media center to the cable system; 2) increased channel capacity; and 3) interconnection with schools within the receiving range of ITFS signals but outside the cable system's franchised district.

Nonstandard channels

Within the television frequency spectrum there is some space that is not used for open circuit television but can be used for closed circuit purposes, although special converters are needed for reception.[29] School authorities should seriously consider requiring that the cable operator provide whatever converters are needed at cost.

POST-FRANCHISE ACTIVITY

Obviously, the foregoing discussion does not apply to those localities which have already entered into a franchise agreement with a cable company. Educators in such localities should begin to prepare for the time when the franchise is up for renewal. Specifically, they should do the following:

1. Study the existing franchise
2. Assess the educational needs

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29. All single cable (as opposed to dual cable) systems with more than twelve channel capacity use nonstandard channels when more than a dozen channels are programmed. When no more than twelve channels are programmed for the general public, the use of non-standard channels is a convenient way to provide restricted access for schools or other institutions.

3. Express a readiness to work with the franchising authorities

4. Discuss their requirements with the operator.

In already franchised locations, insofar as FCC regulations are involved, the concern of educational authorities will be with the expansion of the system's capacity as it applies to additional access channels. Clearly, if the educators are not fully utilizing their channel they have no need for additional capacity. It is both unreasonable and contrary to federal regulations that the cable operator add extra channels reserved for a time when they might be used.

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However, if the need arises and the utilization warrants, extra capacity may be desirable. These cases are covered by the FCC's Channel Expansion Formula,[30] as follows:

> Whenever all of the [access] channels ...are in use during 80 percent of the weekdays (Monday-Friday) for 80 percent of the time during any consecutive three-hour period for six consecutive weeks, such system shall have six months in which to make a new channel available for any or all of the [access] purposes.[31]

In its Clarification, the commission refined the Channel Expansion Formula as follows:

> The 'time trigger'...applies to each channel individually. For instance, if the public access channel is filled to that degree, a new public access channel must be designated upon request regardless of the amount of use being made of the other access channels. Additional special designated channels need not be provided free of charge. Reasonable charges consistent with our access policy can be assessed so long as the free channel in each category remains available on a non-discriminatory basis.[32]

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30. The access channels include the public, local government, educational, and leased access channels.
31. 47 C.F.R. 76.251 (a)(8).
32. Clarification, paragraph 21.

Leased channel

If the suggested leased channel space is available, educators can, of course, lease it. However, other options do exist. If the local government access channel is not being used at the desired time, the local government can permit educators to use that channel. Unlike the other access channels, the operating rules for the local government channel are not controlled by the operator but by the local government itself. Therefore, the local government can assign unused time on its channel to other users.

Shared use of other access channels

Shared use of local origination channel

Another alternative is to request time on the cable operator's local origination channel. Since many operators do not make full use of that channel, this would not be an unreasonable request. On some systems, local educators are, in fact, using the local origination channel for educational purposes.[33]

Use of "blacked-out" time

Another method of expanding capacity is the use of "blacked-out" time. The FCC's regulations provide that, under certain circumstances, some programming may have to be blacked-out on certain channels of the cable system.[34] The cable operator can make that time available to the local educational authorities. Berks TV Cable Company, in Reading, Pennsylvania, has assigned that time to the local schools. Four schools, with origination facilities

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33. If the local origination channel is used, all FCC rules pertaining to local origination (e.g., fairness doctrine, equal time requirements) will apply to the educational programming on that channel. Those rules have not been applied to educational programming on local origination channels over systems built prior to the 1972 cable rules. The rules will be enforced on the newer systems.

34. 47 C.F.R. 76.91 et. seq.

in their buildings, can, by flipping a switch, cablecast their programming to the community on "blacked-out" time available on the channel which normally carries the imported Harrisburg broadcast TV signal.

However, the availability of these options is dependent upon a cooperative cable operator who is willing to work closely with educational authorities. The likelihood of that occurring is vastly increased by the careful choice of the cable operator during the initial selection process. However, it is always safer to "get it in writing."

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Educational channel users within the major markets will have five years from the time the cable system's trunk lines are installed to develop usage of the channel. In the Report and Order accompanying the 1972 cable rules, the commission stated:

> Use of the educational channel will be without charge from the time subscriber service is inaugurated until five years after the completion of the cable system's basic trunk line. After this developmental period--designed to encourage innovation in the educational uses of television--we will be in a more informed position to determine in consultation with state and local authorities whether to expand or curtail the free use of channels for such purposes or to continue the developmental period.[35]

At the end of those five years, the FCC retains the options (among others) of: 1) maintaining the status quo; 2) requiring the cable operator to provide additional free educational access channels; 3) allowing the cable operator to impose a fee for the already-established channel; 4) rescinding the use of the channel; or 5) placing

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35. 36 FCC 2d 141, 191 (1972).

restrictions on the channel's use.

Since the criteria for a successful developmental period are not spelled out, it is impossible to predict with certainty which option the commission will ultimately choose.

Suffice it to say that those channels which are used fully, innovatively, and with measurable educational benefits will be the systems most likely to retain or expand the free facilities.

Summary

In order to maintain free usage, local educational authorities in communities that have not yet issued franchises should take the four following steps:

1. Make certain the franchising authority designates a study committee to gather information on which to base well-informed decisions

2. Make certain that educators have representatives both on the general study committee and on the education subcommittee

3. Begin the study immediately

4. Implement the study recommendations as soon as possible.

Local educational authorities in communities that have already issued franchises should prepare for renegotiation by taking the following steps:

1. Study the existing franchise

2. Assess the educational needs of the community

3. Discuss those needs with the cable operator to see how they can be satisfied using the existing system

4. Discuss those needs with local officials and make sure educators are represented in the renegotiation proceedings.

HOW TO USE THE CHANNEL

Granting that educational authorities should use the cable channel fully and innovatively, the question arises, "How?" The answer to that question depends upon the needs of the community and the resources available to the educational authorities.

In some communities, the most pressing need will be for in-school closed circuit transmission. Other localities will want to reach the nontraditional students--the dropouts, the homebound, the overage or the underage. Still others will give first priority to on-the-job training. Some school districts may prefer to use the cable channel to inform the public about the schools.

Cable transmission differs from the kind of closed circuit transmission found in many schools in that cable has the ability to extend programming beyond school walls and into the community. Cablecasting differs from broadcasting in that the multiplicity of channels available permits programming to be directed at special audiences without usurping the channels needed for programs with a wider viewership. Thus, many cable systems are capable of open circuit programming to specialized audiences, and at the same time contain enough capacity to retransmit broadcast signals in addition to closed circuit applications.

OPEN CIRCUIT

Nontraditional Students

One of the major uses of open circuit cablecasting is to reach nontraditional students--those who, for a variety of reasons, cannot or will not attend school.

College credit courses

An example of the nontraditional student is one who would like to get a college degree but cannot get to the campus when necessary courses are offered.[36] The fact that an audience exists for televised degree-at-home curricula is attested to by the success of Chicago's TV College, a component of the city's higher education system. The Chicago TV College broadcasts its programs over a local ETV station. Since its inception in 1956, over 100,000 people have registered for over 150,000 course hours and over 75 per cent of the registrants have completed the course work. Chicago is, of course, a large city and the size of the local audience for such programming justifies the use of scarce broadcast bandwidth.

Cable permits college credit programming to be cablecast to much smaller audiences in much smaller communities. The programming can be obtained either by acquisition of prerecorded

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36. The high degree of interest by institutions of higher learning in cable television is indicated by the fact that over 400 administrators and faculty members attended the invitational conference, "Cable Television and the University," sponsored by EDUCOM, the Educational Testing Service, and the Cable Television Information Center in Dallas, Texas in January 1974. (Conference proceedings are available from EDUCOM, P.O. Box 364, Princeton, N.J. 08540 for $5.00.)

material[37] or by the creation of video courses at the local higher education institution. A number of institutions have, in fact, created their own material for cable transmission, albeit with mixed results.

In Palm Desert, California, the local junior college offered college credit courses on business law, real estate and history--then cancelled the series because of declining enrollment.[38] Yet, Tyler Junior College in Tyler, Texas, has continued to cablecast courses in Spanish, Texas history and American history--though this year there were 10 Spanish students, 15 American history students, and a large noncredit audience. Dean I. L. Friedman, who is in charge of Tyler's effort, reports that the college is well satisfied with the results.

The cable systems of the two communities are about the same size--12,000 subscribers in Palm Desert, 16,000 in Tyler--and the numbers of enrolled students at Tyler are not much different from those at Palm Desert. However, one school's success was another's failure. The essential difference lies in the definition of goals by the two institutions. Any school embarking on a cablecast

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37. Chicago's TV College, for instance, distributes video course material through the Great Plains National ITV Library in Lincoln, Nebraska. Material from Britain's Open University is being used at Rutgers and at the Universities of Maryland and Houston. The SUN project at the University of Nebraska is currently developing a program for higher education at home which will include cable television among the delivery options. See Appendix D for other program sources.

38. The History of Africa and the Middle East, for instance, began with 30 students. Twelve students finished.

Enrollment goals

courses-for-credit program should, at a minimum, decide beforehand what its enrollment aims are. How many enrolled students are required? Is the measure of success to include "audits?" Is the object of the cablecast courses to enroll as many people as possible or is there a specific target audience--low income adults, for instance?

Another experiment in cablecasting, at New York State University College at New Paltz, N.Y., was discontinued when "only" 30 students signed up for the course "Psychology Today." A spokesman at the college felt that the single cablecast undergraduate course could not meet the needs of the at-home student. He stated that the students were probably at home because they could not get to the campus, and that one cablecast course would not further work toward their degrees. He suggested that an entire undergraduate curriculum would be necessary to satisfy the demand. Alternatively, a single graduate course could be cablecast to satisfy the needs of professionals--school teachers, for instance--who require professional upgrading.

Amarillo College, in Amarillo, Texas, has been offering at-home courses for credit for many years, at first by broadcast television and later on the cable system. Without an ETV outlet in the area, Amarillo used the commercial station at a commercially unpopular hour, 6:30 AM. With the advent of cable, the college was able to retransmit the courses to cable subscribers during prime time.

Amarillo College experienced a unique demonstration of the relationship between local community needs and televised courses for

credit. Normally, the Amarillo offerings (accounting, freshman English, consumer buying) number their enrollees in the dozens from among Total TV of Amarillo's 11,000 subscribers. When the public schools changed their curriculum from old to new math, the college telecast a modern math course. The enrollment for that course was over 700!

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Between the acquisition of prerecorded material and the creation of video courses by individual schools is the consortium approach taken by the 31 institutions forming the Southern California Consortium for Televised Instruction. Using both leased and campus-produced material, the consortium telecast nine different courses, two per semester. In its pilot year, 1970, enroliment was about 700 students. In fall 1972, enrollment was 5,728. For the most part, the courses have been carried on broadcast television. During 1974, however, the two Bakersfield cable systems have agreed to cablecast the program and those systems alone have produced 400 new students (in part due to a publicity campaign on the part of the cable systems).

Evaluation of the course indicates that there is no significant difference in test results of students who have taken the televised courses compared with classroom students' results. However, the TV courses produce more dropouts--à situation attributed to the greater ease of enrollment by the TV students.

The success of the Southern California consortium is at least partly attributable to the fact that the member schools are similar institutions which serve similar student bodies. Therefore, agreement

on courses and content was easier to manage than if a consortium were to include research institutions, land grant colleges and community colleges. The commonality of style and goals appears to be an essential ingredient of successful consortia.

Too broad a consortium also neutralizes a prime advantage of cable--that of "narrowcasting." Studies[39] have shown that the first study preference of adults is vocational subjects--architecture, business skills, industrial trades, etc.--with 43 per cent listing a vocational subject as first choice. In second place, with 13.4 per cent, are hobbies and recreation, followed by home and family life, personal development, general education, public affairs, religious studies and agriculture and farming in that order. However, a survey in Gainesville, Florida indicated that recreation and hobby courses were the first choice there. In Berks County, Pennsylvania, general education is the first preference. Thus, while national averages are useful guides for course offerings, the specific courses to be offered in any individual community should be determined by a demand analysis of that community.

Before deciding if and what video courses to offer for credit, institutions of higher learning should take the following steps:

Procedure for credit courses

1. Assess the demand in the community. Is there sufficient need for video courses-for-credit? If so, what courses?

2. Assess the resources of the school. Are there talent, facilities and money to produce the needed courses?

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39. See The Aspen Notebook: Cable and Continuing Education (New York: Praeger Publishers, 1973), p. 12.

3. Survey the prerecorded material available. Will that material satisfy the need better or less expensively than the school can?

4. Explore the possibility of producer/user consortia with similar institutions.

5. Define the goals of the program and cite the criteria of success in terms of how many and what kinds of students are to be reached.

6. Set up an evaluation mechanism to measure the goals against the actuality.

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At the preuniversity level, the educational channel presents a diversity of options for reaching a variety of nontraditional students. Many of these nontraditional students have traditional goals, i.e., the acquisition of credentials. At the preuniversity level, that goal

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quivalency

is often realized by taking and passing a high school equivalency test. The most widely used televised preparatory material for students taking the test is "Your Future Is Now," produced by the Manpower Education Institute in New York and distributed by Great Plains National Instructional Television Library at Lincoln, Nebraska. This material is acquired for statewide use in 42 states and is shown on public television. As of the publication of this report, over 150,000 television students had passed high school equivalency examinations. The course is currently being evaluated under an HEW Office of Education grant by agencies in Nebraska, Mississippi, New York and South Carolina. In those states using the Manpower course, that material can be retransmitted by cable systems.

The Kentucky ETV Network has embarked on a General Educational Development (GED) project, aimed at the ultimate production of a "technology-based open learning system" to prepare students to

qualify for and pass a high-school equivalency exam. The program will utilize both video and printed material (as does "Your Future Is Now"). The programs are scheduled for national distribution in 1975. The Kentucky printed material will be closely integrated with the video material.

For three years prior to initiating its own project, Kentucky used a GED series prepared by Spokane (Washington) Community College in order to test the GED-via-TV concept. In the Kentucky test, the highest number enrolled in any one semester was 1,500, not counting "auditors." Of those enrolled, 182 took and passed the GED exam--although a spokesman for Kentucky ETV suggested that the sampling procedure skewed the taken-and-passed result downward. The Spokane material, which is available from the college, has also been used in Detroit and in Baltimore and McDermott, Maryland. No comprehensive evaluation has been made.

An attempt to distribute locally produced GED material through a local cable system was made by State Fair Community College in Sedalia, Missouri. Produced at the college, the program was a "talking head" series, with minimal use of graphics. The series could be seen in the 4,500 homes connected to the cable and in a number of public locations.[40] Of the 21 students who enrolled and received study guides, one student took and passed the GED exam, one student took and failed it, and one student transferred to campus

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40. The cable company, Cablevision, Inc., supplied the connection to the public locations. Holiday Inn furnished the television monitors.

instruction. Because of the disappointing results and the fact that the tapes deteriorated upon reshowing, the cablecasting was discontinued.

Teaching of English

There have been many discussions of the teaching of English to the foreign-born via open circuit TV. However, there have been few attempts to do so and, to the center's knowledge, no reliable national evaluations. The program "Ingles con Rita Madero" was offered by the TelePrompTer Manhattan system in New York City, but discontinued, according to the operator, because the number of viewers did not warrant the time on that system's local origination channel.

"Carrascolendas," a program produced at KRLN in Austin, Texas, is a general series aimed at filling Chicano children with a sense of the uniqueness and value of their background. One component of the series is the development of language skills. While the series is designed primarily for in-school instruction, it has been shown nationally on public television, augmented by cable systems. There is evidence that language skills improved when the series was used in the schools. No evaluation of the at-home viewers has been attempted.

Preschool

Another nontraditional learner is the preschool child. To date, the most usual source of cable television programming to the preschoolers has been the public libraries, generally with cablecast story hours.[41]

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41. Public libraries in LaCrosse, Wisconsin; Casper, Wyoming; Columbus, Ohio; Mobile, Alabama; Bakersfield, California; Orlando, Florida; and Rochester, Minnesota, are all cablecasting story hours. For a comprehensive overview of library cable activities, see the ISAD Cable-TV Information Packet, (Chicago: American Library Association, 1973).

At least two institutions of higher learning are cablecasting material aimed at youngsters. Southwestern State College, in Weatherford, Oklahoma, produces a preschool music program. Central Missouri State University, in Warrensburg, Missouri, cablecasts "Captain Platypus Duck," described by George Carr, manager of CMS-TV, as "a poor man's Captain Kangaroo." The CMS studios are connected to five cable systems either by wire or by microwave. In addition, videocassettes are sent to the Sedalia, Missouri system[42] for cablecasting there.

The Willingboro, New Jersey public schools presented two school-to-home programs for preschoolers, a reading readiness series and later, a mathematics series. Spokesmen for the schools stated that the reading readiness project was "not our best effort," but that the math program was somewhat more successful. There was some evidence indicating that preschoolers who enrolled in the math series (about twenty youngsters) did better in arithmetic on entering school than those who had not enrolled. The program was discontinued after the second year when federal financing ran out. No extensive evaluation was performed.

Willingboro chose not to continue the program without the federal funding, opting for an in-school ITV effort because of the certainty of reaching the "captive audience." The Willingboro schools continue to use the cable system for public information

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42. The Sedalia system has loaned CMS-TV 3/4" videocassette equipment to record material to be cablecast in Sedalia.

programming.

Nondegree-oriented adult education

Aside from cablecasting to nontraditional students with traditional goals, cable systems have been used extensively for noncredential-oriented adult education. Central Missouri State University has produced a considerable amount of noncredit material, including courses in home economics, golf and history. Southwestern State College did a major series for senior citizens, including instructional programming on photography and various arts and crafts.

Lincoln University cablecasts on both the San Francisco and San Jose, California cable systems. In cooperation with Communications Library of San Francisco, Lincoln has produced such series as one on law for laypersons and a symposium on "The Role of Women in the Growing Economic and Social Ties with Asia."

The University of Oregon, which makes extensive use of the Eugene, Oregon cable channel, has cablecast programs ranging from fly-tying lessons through discussions of the social and political problems of Indonesia.

Thus, the gamut of programming for nondegree-oriented adult education (with a few exceptions) covers the same subjects as do credit courses--but generally with emphasis on the relationship of those subjects to day-to-day living.

Vocational subjects

Vocational subjects for nondegree-oriented adult education might include law for laypersons, the preparation of income tax returns or how to repair a bicycle.

Hobbies and recreation

Hobbies and recreation are mainstays of many adult education programs. Golf and tennis lessons have proven their popularity

nationwide. Bridge and chess have great appeal in many communities. Music lessons, particularly those covering such relatively inexpensive instruments as the guitar, dulcimer or recorder, are in demand in some localities.[43] Travel features, particularly those concentrating on nearby places, are appropriate to adult education on the cable system.

Home and family life

Home and family life programs include everything from child development through the care and feeding of house plants to the conservation of fuel oil.

In fact, many of the subjects students take for credit, someone will want to take for fun. The questions are: 1) Is there demand for a particular program in the community? 2) And if so, who will produce the program? The examples of actual programs given above are produced by traditional schools. If, however, the community regards other agencies (the local botanical garden, for instance) as "educational authorities" there is no reason why relevant adult education programs should not be produced by them--assuming they have access to production facilities.

Traditional Students

Open circuit transmission to traditional students has generally taken the form of "enrichment" programs. The Willingboro, New

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43. Video presentations similar to the record series "Quartets Minus One" are possible. In such a presentation, one member of the musical ensemble is missing, that musician's place to be taken by the home viewer. The advantage of video in this case would be that the home participant could see the leader's cue.

Jersey schools have presented a wide variety of that kind of programming. There, the high school German classes have cablecast a German version of Poe's "Telltale Heart" and an elementary school art instructor has a program on creative paper folding. The Governor Mifflin School District in Reading, Pennsylvania, has cablecast student-produced shows on environmental pollution.

In and out of school

A number of school districts simultaneously distribute programming within the school and out over the local cable system. This is a convenient arrangement both for the classroom, where the teacher is available to work individually with students, and at home, to homebound students (seriously handicapped or out temporarily) or to members of the community who want to see what is going on in the classroom. These programs can be either "enrichment"-type shows which supplement classroom instruction or can stand as lessons in themselves.

In Ponca City, Oklahoma, Studio SEE--managed by the school system's audio-visual director and almost entirely crewed by high school students--has an active production schedule. Apart from pure enrichment programs ("Music Fun with Uncle Pete"), Ponca City tapes such instructional programs as "Gabby Gibbons and the Numbers Game" (primary math), "Kathy Katerpillar and Mr. V" (primary science) and "Arty Facts with Freckles" (primary art). In the evening hours, studio use reverts to the cable system for local origination programming.

The Denison, Texas,[44] schools have a similar ITV program. In Denison's case, two cable channels are used. Denison has taped series on geography, language, music, etc. Bill Blankenship, director of special services and ITV program director, stated that they had found that "growing programs at home" was considerably less expensive than leasing programs from a national type library. Blankenship pointed out that the locally produced material could be reused indefinitely, whereas leased material can become expensive used year after year. Like the Ponca City operation, the Denison studio is crewed by students.

The Malden, Massachusetts, schools use the facilities of the local cable system for the weekly cable class "Kids Today" in which an elementary school class is transported to the Malden Cablevision studio for a cablecast lesson taught by local professionals. Guest instructors have included a chef, a herpetologist and a dance troupe.

Informational and Public Relations Uses

The educational channel is not only a communications avenue to students but also to the community at large, carrying information about the schools and performing various other service functions such as cablecasting school sports, career information, etc. In addition to service programming, the channel can be and has been used for more controversial programs, such as those dealing with

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44. Both the Ponca City and Denison studios are maintained by the cable systems (in both cases Cablecom-General) at no cost to the schools.

school bonding issues and school board meetings or elections. Whether to cablecast either or both types of programs (service and/or controversial) on the educational channel is a question each locality must answer for itself.

Service programming

The kind of service programming that is both possible and appropriate to cable television is limited only by the imagination. State Fair Community College (Sedalia, Missouri) is preparing for cablecasting a series that will attempt to relate State Fair's curriculum to the job market, acquainting the students with employment possibilities and introducing the business community to the students and their skills.

School and jobs

Educational institution survey

A potentially valuable service in regions that are rich in educational opportunities is a survey of the school options, showing the facilities of the various institutions and explaining the differing philosophies. The experience of Washington, D.C. area private secondary schools is indicative of community need. Because of the paucity of information about the program and outlook of the secondary schools, some of the primary schools hold "high school days." The secondary schools send representatives (both students and faculty) to describe their institutions. The secondary schools have discussed holding a joint "day" for all the feeder schools, but problems of logistics, scheduling and the availability of space have thus far proved insurmountable. That is the kind of problem that cable television surmounts easily.

Student activities

Schools at all levels have found cable a valuable asset in extending the audience for student activities. School sports, cablecast

either while they are happening or tape-delayed, are among the most popular programs. Central Missouri State cablecasts all home university and university high school football games and all home university basketball games and wrestling matches. They also cablecast the women's basketball games and the Women's Basketball Regional Tournament. Muhlenberg School System in Berks County, Pennsylvania, cablecasts swimming meets. TeleprompTer Manhattan presents local football matches (Columbia vs. Princeton, for instance).

Other school activities have not been neglected on the cable. The Willingboro, New Jersey elementary school's band, orchestra and chorus have been seen in concert. The Long Beach, California, schools cablecast their Christmas concerts. Governor Mifflin School District in Berks County, Pennsylvania, presents the marching band. The Overland Park, Kansas, cable system cablecast an election year mock political convention held by high school students. Lincoln University in San Francisco showed their "Festival of All Nations," an international student festival. School drama presentations (the Ann Arbor, Michigan, cable company is planning to cablecast the University of Michigan opera) and intermural academic competitions (such as "Quiz Bowl," produced by Central Missouri State) are other high interest presentations.

Information about school activities

Information about school activities--rather than the activities themselves--and programs dealing with areas of interest to both the schools and the community are another source of public relations programming. "Coaches Corner" is a popular feature on dozens of

cable systems including those in Winona, Minnesota; Reading, Pennsylvania; and Lawrence, Kansas. "Amarillo College Presents" is a video survey of what is happening in the college's various departments. "School News" is done by high schools in Winona, Minnesota; Denison, Texas; and Reading, Pennsylvania. Malden, Massachusetts cablecasts "Youth Forum" which features high school students, a teacher and, if appropriate, someone from the community discussing topical subjects.

Many schools have produced community interest programs. Mishawakwa High School, in South Bend, Indiana, did "Crossfire," a program that debated the advantages and disadvantages of year-round school. Amarillo College produces "It's a Women's World," a series designed to show how women can manage a successful career-family combination, and "Examine," a series that relates national occurrences to the local scene (one program was about the effect of the national truckers' strike on Amarillo). The University of Oregon (Eugene, Oregon) has shown a discussion of trends toward sexual permissiveness in films and stage presentations. Southwestern State College (Weatherford, Oklahoma) has done programs on social security. The Malden, Massachusetts schools, among many other districts, have participated in drug abuse education programs.

Debt and budget increases

Different localities regard their schools in different ways. In some communities, informational material about such school matters as debt or budget increases are mailed by the school administration and gratefully received by the public. In other districts, such mailings have been greeted by immediate lawsuits. Whether or not a school district should use the educational access channel to cablecast that kind of

"Controversial" programming

"controversial" material depends entirely on the community.

School board elections

The decision to use the educational channel to cablecast campaign speeches by school board candidates is also one that depends upon local opinion.

School board meetings

The same can be said of the school board meetings themselves. The Willingboro, New Jersey, public schools are now cablecasting the meetings on the educational channel. Other older systems which do not as yet have the assigned channel cablecast the board meetings on the local origination channel (Lawrence, Kansas, for instance). When the latter systems are upgraded (by 1977), the decision will have to be made as to whether or not to shift the meetings to the educational access channel.

Student Training

It should be noted that many--although by no means all--of the schools that produce a great deal of open circuit programming on their local cable systems use the studio as a workshop in telecommunications classes.[45] The Denison, Texas, school system has a "delayed credit" arrangement: after a year of working in the studio (as camera operators, graphic designers and directors), students may take a class in communications and get credit for working in the studio. Lincoln University has a communications lab course which makes extensive use of San Francisco Cablevision's studios. The Malden, Massachusetts,

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45. A significant exception is Willingboro, New Jersey, which has a formalized training program as an extracurricular activity.

high school's communications course is taught at the studio. The shows produced are cablecast biweekly. Both the University of Oregon (Eugene) and Oregon State (Corvallis) have sophisticated teaching studios of their own, as do Southwestern State (Weatherford, Oklahoma) and Central Missouri State (Warrensburg).

Community to School

The avenue provided by cable television for schools to reach the community has proved to be a two-way street. The professional resources of the community can be utilized, as demonstrated by the cable classes being taught by local experts in Malden, or community opinion can be directed to responsible administrators as in Denison, where the superintendent appears on the cable each month and answers phoned-in questions.

CLOSED CIRCUIT

In-School Use

As mentioned above, cable television permits educators to cablecast into the community while still allowing closed circuit use of the medium.

The Washington County (Hagerstown) Maryland public school system probably has the most comprehensive closed circuit ITV system in the country. Forty-five schools are linked by coaxial cable. A six-channel system which carries programming from a central studio reaches all elementary school classrooms, all middle

school students (not necessarily in their classrooms) and selected high school students. The system, installed by the local telephone company, is not part of the commercial cable system. (Hagerstown's cable system was established in 1967, eleven years after the closed circuit system was installed.) The cost of establishing the system and operating it for a five year study period (1956-1961) was $1,300,000, excluding telephone company installation costs. The current annual operating budget is $280,000.[46]

The Washington County Closed Circuit Television Report states that the expenditure was worthwhile, as follows:

> There was a time when it was thought that the cost of a county closed-circuit network would make its use prohibitive. But this has not been the case. The redevelopment of personnel and equipment made possible by television has produced savings which cover the annual operating costs. And in terms of duplicating in conventional classrooms what is now offered on television the county's savings are substantial. Without television, the county would require more than one hundred additional teachers and a budget increase of almost $1,000,000 to duplicate the courses that have been added to the instructional program. This is more than three times the annual operating cost of the television network. For example, without television it would cost more than $250,000 annually to provide art and music specialists for the elementary schools.[47]

Nevertheless, some other school districts contemplating the extensive use of closed circuit television found that both the initial outlay and the projected operating budgets were too great to bear. However,

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46. The above information is contained in the undated Washington County Closed Circuit Television Report (report of Washington County Board of Education, Hagerstown, Maryland). The publication date is not available, other than that it was "ten or eleven years ago." Indications are that expenditures may have risen by a factor of more than two.

47. Washington County Closed Circuit Television Report.

the advent of a cable system--with its coaxial cable, drops to the schools, shared facilities and technical assistance--could make a difference in the financial picture. Decisions should be reassessed with that in mind.

The evaluation of the Hagerstown ITV curriculum, which is totally integrated with classroom instruction, indicated that "Where television is used in a course year after year, higher achievement is generally maintained and improved upon in succeeding years..." A five-year study by the Anaheim, California, public schools showed similar results.[48] They report that "The groups receiving instruction by means of related classroom and televised teaching were found to be consistently superior to the conventionally taught group."

It is not a purpose of this report to argue the merits of classroom television teaching. However, the point may be made that, given the facilities of a local cable system, school districts may have useful instructional options which were not hitherto available.

In general, in-school use of cable television permits greater use of "special" teachers, or equipment, allows a greater variety of teaching techniques to be used, expands classroom space[49] and permits interconnected schools to share student projects and talent.

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48. Teaching with Television (report of Department of Instructional Media, Anaheim School District, Anaheim, California; undated).
49. The Hagerstown report points out that "In several county schools pupils would be attending classes in shifts if it were not for space economies made possible by television."

Among the universities making extensive use of closed circuit television are Brigham Young,[50] in Provo, Utah, and Oregon State University in Corvallis. OSU sends between 35 and 40 hours a week in instructional programming over Channel 5. The video classes can be watched by students on the campus in one of five viewing rooms or at home. Additionally, any cable subscriber in the Oregon towns of Corvallis, Albany or Lebanon can watch the class.[51] The channel's program schedule includes such courses as psychology, math, economics and biology. OSU officials state that the use of the cable system allows instructional savings of about $55,000 annually. That is, if television were not used it would cost the university $55,000 more each year to maintain the present level of instruction.

It is not only at the university level that local cable systems are used for closed circuit instruction. Much of the programming done by the Willingboro, New Jersey, schools is for in-school use. The school districts served by Berks TV Cable Company and Suburban Cable in the Reading, Pennsylvania, area can cablecast either on closed circuit or into the community.

School to Elsewhere

While the center knows few examples of closed circuit educational programming being delivered to another institution via a local

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50. Like Hagerstown, Brigham Young has a discrete system unconnected to public cable.

51. In addition to the Channel 5 programs, OSU utilizes five closed circuit channels for classroom-only view. OSU also programs Corvallis' Channel 11 with "public relations" presentations.

cable system, there is no reason why this cannot be done if the demand exists.[52] [53] Indeed, many microwave or telephone intercity systems now in operation could serve as prototypes. Southern Methodist University's Institute of Technology uses "talkback" TV for off-campus graduate engineering courses. A combined closed circuit and microwave system, it sends live video into places of employment and receives telephone talk-back patched into the same microwave system. Stanford University and the University of Minnesota have similar networks.

On-the-job training

Police training

The South Carolina ETV network has used closed circuit for a statewide law enforcement training program.

Medical education

A number of medical schools transmit continuing medical education directly to medical personnel in hospitals. The Louisiana Hospital Television Network, the Ohio State University Medical School and the Medical Educational Resources Program (MERPS) of the Indiana University School of Medicine[54] all utilize over-the-air closed circuit transmission.

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52. The Adrian, Michigan, schools contemplate closed circuit programming to a nearby state training school.

53. A medical education series produced by Roche Laboratories is carried on several cable systems and received by subscribing physicians in their homes, using equipment which allows only authorized homes to receive programming.

54. MERPS microwaves its programming to the Indiana Higher Education Television Service facility at Purdue, which retransmits the signal throughout the state. In Lafayette, the local cable system uses a mid band channel to retransmit the signals to local hospitals.

It is conceivable that closed circuit cable will eventually be used for continuing legal education,[55] extending the classroom to hospitalized students or carrying academic instruction to vocational schools.

CABLE AND ITFS

A question that is often raised in discussions of uses of cable television is "Why would educators use cable when ITFS[56] has not been widely used?" ITFS, after all, has been available since the early 1960s.

As pointed out at the beginning of this section, cable TV has the advantage over any closed circuit system in that it allows the educator to reach the community. Even for in-school use, cable has certain advantages over ITFS transmission. First, if the cable operator provides the interschool links free or, in some cases, even if the operator provides the links at cost, the transmission of programming is much less expensive via cable since individual schools need not be equipped with receiving antennas (parabolic reflectors) or--if the school has origination capability--transmitters. Second, cable does not depend on line-of-sight transmission. Third, reception from cable is better than from ITFS in areas of poor reception.

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55. See Dresnick, "Uses of Videotape Recorders in Legal Education," University of Miami Law Review, V. 25, N. 4, Summer 1971, pp. 543-595.
56. See page 50, below, for a fuller discussion of ITFS.

This is not to say that ITFS should be rejected. In fact, wherever possible, existing ITFS systems should be connected to the cable. As mentioned in the section on franchise provisions, this can not only provide a return link to the headend but can also expand the capacity of the educational distribution system. ITFS is a particularly valuable adjunct for large geographic areas in which the costs of cable interconnection are prohibitive or parts of the district are not in the franchised area.

PAY TV

The "to-the-job" educational networks described above are aimed at professional upgrading. In those examples, employers pay the university for its programming. In the examples cited in the section on courses-for-credit, the educational institution is paid by the student either at the time of enrollment or when examinations are taken.

Another possible method of marketing education on cable is through the use of pay TV.[57] Some educators are considering pay TV as a method of distribution, although center staff members know of no significant case where education has been sold on pay TV.[58] Market

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57. Pay TV is a system in which either 1) scrambled signals are distributed and then unscrambled at the homeowner's set with a decoder on payment of a fee; or 2) subscribers pay an extra fee for access to a special channel.

58. Optical Systems, a pay TV company, has developed some educational programs, e.g., guitar lessons, but has not marketed them as of this publication. Suffolk Cablevision, Suffolk County, New York, devotes morning time on a pay TV channel to children's educational programming.

studies done for the Hughes Corporation[59] indicate that a pay TV market exists for cultural programming via satellite (at monthly charges up to $5), but no information was available vis-a-vis local markets. H.S. Dordick, former director of Telecommunications for the City of New York, has developed Business Plan Edu-Cable, a model for using leased channels to provide educational courses on a profit-making basis.[60]

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59. See remarks by Paul Visher in the Symposium on Urban Cable (McLean, Virginia: MITRE Corporation, 1972), pp. 133-142.
60. See The Aspen Notebook, pp. 119-125.

TECHNICAL AND ECONOMIC CONSIDERATIONS

Several levels of program origination and transmission can be considered. Instructional television programs can be bought or rented,[61] they can be produced in conjunction with the local public television station, or they can be produced by the schools on their own equipment. Acquired or self-produced programs can be played back on the facilities of the cable operator if the system has playback equipment compatible with the recorded material, or they can be played back from the school system if a link is established between the playback point and the cable system headend. With a higher degree of flexibility, provision can be made for playback from a number of schools if links are established from each of them to the headend. With such an arrangement, each school equipped with camera equipment and a link can originate live programming for distribution to other schools on the system. It would thus be possible to extend the range of classrooms with specialized equipment or to make better use of the time of specialized teachers. Both goals could be accomplished by televising such classes in progress and transmitting them to other schools.

Instructional television programs can be bought or rented from a variety of sources. Prices range from zero for sponsored or government supplied programs to several hundred dollars per program from commercial sources. Two major suppliers of instructional

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61. See Appendix D.

programs are the National Instructional Television Center of the Agency for Instructional Television at Bloomington, Indiana, and the Great Plains National ITV Library. Each makes programs available in a variety of formats (16mm film, 3/4" videocassettes, 2" videotape, etc.). Both publish catalogues and price lists which are available upon request.

The most practical formats for school or cable system origination are 16mm film, 3/4" videocassette, and 1" videotape. It is also desirable to have provision for playing 1/2" videotape and 35mm slides. As noted earlier, these playback facilities can be provided on the cable system's premises or located at the school media center, if there is a link to the cable system.

Options for Equipment

Facilities for the production of instructional material cover a broad range of capability and price. At one extreme, a production facility might consist of a portable 1/2" videotape player/recorder and hand-held black and white vidicon camera. (Sony makes and sells such a system, known as a Portapak, for about $1,500.) At the other end of the spectrum are fully equipped color studios and 2" videotape machines which characterize commercial broadcast TV facilities. These studios can cost up to $750,000 or more. Obviously there are many intermediate possibilities.

In a study prepared for the Massachusetts Advisory Council on Education[62] the following options for origination equipment are described:

Option A: Cablecasting Existing Audiovisual Material
To cablecast existing audiovisual material--including black and white or color film, slides, filmstrips and 3/4" videotape cassettes--you will need:

1 film chain (color)	$15,000 and up
1 3/4" color videotape recorder	$1,525

Note that the Massachusetts Executive Committee for Educational Television has established 3/4" videocassettes as its standard distribution format.

Option B: Mobile Production of Unedited Original Material
To produce original material of a simple documentary nature outside a studio you will need:

1 portable, battery-operated, black and white video camera and a 1/2" videotape player/recorder	$1,500

This is commonly known as a Portapak (although that is Sony's tradename). The package includes a camera, battery-operated recorder/player, hand-held microphone, etc. Half-inch tape costs about $30 an hour.

Option C: Studio Production of Edited Original Material, Black and White
To equip a fairly simple studio capable of producing programs on black and white 1/2" videotape, consider:

2 black and white cameras @$2,000/each	$4,000
2 1/2" editing/recording decks @$1,400/each	2,800

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62. The Here, Now and Tomorrow of Cable Television in Education (Boston: Massachusetts Advisory Council on Education, 1973), p. 10.

6 microphones @$50/each	300
2 portable lighting kits @$500/each	1,000
3 9" monitors @$260/each	780
1 special effects generator	1,000
2 RF units @$65/each	130
1 audio mixer	125
1 processing amplifier	3,500
miscellaneous cable and console	250
	$13,885

Option D: Studio Production of Edited Full Color Material on 1" Videotape
A full color studio would require at least:

2 color cameras @$10,000-$15,000/each	$25,000
1 1" recording/editing deck	10,000
2 color monitors	1,000
1 switcher	2,500
1 sync generator	3,800
accessories	3,000
1 console	750
	$46,050

Additional equipment might be:

multiplexer	$4,000
distribution amplifiers	4,600
oscilloscopes	4,000
film projector	3,000
slide projector	1,000

Another arrangement which permits live televising of classes is the one used in the Stanford University instructional television network. This network brings campus classrooms and instructors to graduate students employed by participating companies in the San Francisco Bay area.

A typical studio classroom on the Stanford campus includes two cameras, one over the instructor's desk and the other at the rear of the room. Both cameras have remote controlled tilt, pan and zoom capability. The overhead camera is used for viewing information generated by the instructor at the desk--viewgraphs, slides and other materials that the instructor may bring into the class. The rear camera can view the entire classroom, show close-ups of the instructor or follow the instructor's work at the blackboard.

The studio production staff for each televised class consists of a single student operator who is responsible for the camera controls, switching of cameras, audio control and the talkback system.[63]

In other arrangements for televising classroom instruction, the teacher--with the aid of a monitor--controls tilt, pan and zoom functions with remote controls at the desk.

Southern Methodist University Institute of Technology operates a similar system called the TAGER network in the Dallas-Fort Worth

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63. Joseph Pettit and Donald Grace, "The Stanford Instructional Television Network," IEEE Spectrum, V. 7, N. 5, May 1970, pp. 73-80.

area. SMU estimates the cost of each of four studio classrooms, with all associated electronic equipment, at approximately $60,000.[64]

From the Classroom to the Cable

Instructional programming can be transmitted from the school to the cable system in several ways. If the cable system has playback equipment compatible with the format of the schools' instructional materials, programs can be transported to the cable operator for playback on the cable system's facilities. If programming is originated from only one or a few schools, it may be practical to transmit television signals to the cable system via microwave link or cable.

Instructional Television Fixed Service (ITFS) is a microwave frequency which has been set aside by the FCC for educational use. If a school system is already broadcasting on ITFS, it is a simple matter to provide the cable operator with a receiver. The question of who pays for the receiver (less than $1,000) can be included in franchise negotiations. If the franchise is already in existence, it may be possible to come to some agreement at the time the link is activated.

If the school is not presently using ITFS, installation of a transmitting system will cost about $1,000 per channel for the transmitter. The commission's rules allow four channels per licensee.

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64. Charles Vail and Stuart Bush, "Talkback TV at Southern Methodist University: Four Years of Experience," Proceedings of the IEEE, V. 59, N. 6, June 1971, pp. 954-960.

Microwave frequencies other than ITFS can also be used. Costs of such systems vary. One western Massachusetts school district spent $15,000 to connect its junior high school to the headend of the local cable system.[65]

Connecting a number of schools to the headend with individual cables from each school can be expensive. A more practical alternative would be to run the same cable by a number of schools, assigning a channel to each. Costs will vary depending upon the number of channels to be transmitted, the number of schools connected and whether cable construction is above or below ground. In general, the cost of this kind of interconnection corresponds to that of general construction of cable systems, ranging from $5,000 to $10,000 per mile for aboveground construction.

On cable systems with two-way capability, it may be possible for some number of schools or other institutions to transmit video in the reverse ("upstream") direction back to the headend on the cable system itself. There are very few operating two-way cable systems at the present time, so this kind of linkage may have to wait future development.

From the Cable to the Classroom

In order to make cable signals available within schools, each school building must: 1) be hooked up to the cable; 2) have internal

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65. See The Here, Now, and Tomorrow of Cable Television in Education.

wiring within the building to carry the signals to classrooms; 3) have converters if the cable carries more than 12 channels; and 4) have a television receiver at each viewing location. Each of these components has a range of costs.

A school building may be charged for a cable drop at the same rate as home subscribers, but often a franchise will include provisions for a free drop to every school, library and sometimes other public buildings. Without further wiring or amplification a single drop will provide signals to one or two television receivers if they are not too far from each other.

To make cable signals available to classrooms, the building has to be wired. The cost of accomplishing this ranges from $40 to $125 per outlet, varying with the layout of the building, local labor costs, etc. In some cases, schools have made arrangements in which the cable operator has wired school buildings charging only for the cost of materials. This possibility is worth exploring. The wide range of costs for wiring buildings also makes it worthwhile to shop for the best price. Electrical contractors are sometimes willing to work at reasonable rates during their off seasons. Companies which sell equipment and perform installations are sometimes able to make attractive package deals.

The question often arises as to whether buildings which have a master antenna system or are otherwise wired for television can use the existing wiring for distributing cable signals. Generally, the older the system, the less likely that it will be able to handle the full channel capacity of modern cable systems. In some cases,

the wiring will be adequate but the amplifiers will have to be changed. In others, the whole system will need to be replaced. Others may be suitable as they are. The wisest course is to get the advice of a television systems consultant.

If the cable system delivers more than 12 channels on a single cable, converters will be needed for each television receiver. Converters, costing between $30 and $50, can be obtained through the cable operator--possibly at cost--or on a rental arrangement. It is also possible to buy them directly from the manufacturer.

The next cost is that of the television receiver. Black and white sets range from $150 to $300, color from $350 to $500. It may not be necessary to have a television set for every classroom. Receivers can be mounted on roll-around carts and moved into classrooms as needed. An estimate should be made as to the maximum number that are likely to be needed at any one time and a few more added to allow for those out of service.

OBSTACLES TO THE USE OF CABLE[66]

The problems associated with costs, production and unfamiliar technology are not the only ones that tend to keep the educators off the cable. A summary of some of the more frequently raised problems follows.

Difficulties in Gaining Access to the Cable

In the preceding discussion of regulation and franchise provisions, it was pointed out that the FCC requires only one educational access channel and that only for systems in the top 100 markets. Thus, it is essential that educators in the smaller markets make provision for educational access in the franchise. If the use of more than one channel is desirable, in any market, a detailed special showing for the commission should be prepared.[67] Leased channels, at educational discount rates are another possibility.[68] In older systems, already franchised, it may be possible to gain access either on the local origination channel or during the "blacked-out" time on another channel. The essential ingredient in gaining access is a "play-maker"--a person in the community who acts as a catalyst for action. Occasionally the play-maker is the cable operator or program director. More often that person

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66. See The Aspen Notebook, pp. 50-56.
67. The Anaheim, California schools, which already make extensive use of closed circuit ITV, have requested five educational channels.
68. See discussion of discount rates, pp. 10-11.

will come from a government office or from the educational community. In many cases the play-maker is simply a "super citizen" who is willing to spend the unending hours it takes to put the committees together, goad the members into hammering out workable plans, soothe ruffled feelings and stand modestly by while someone else claims credit for the results.

Limited Reach of the Cable

In any cabled community, it is likely that the system will reach into less than half the homes.[69] While this is not a factor when considering in-school use of the cable, low penetration certainly mitigates against school-to-home use. The situation can be improved, perhaps significantly, through the use of viewing sites in such places as the public libraries, government buildings, campus centers or the cable system's facilities. There is some indication that to-home educational programming itself will increase cable penetration. Hughes Corporation market research[70] indicates that between eight per cent and twelve per cent of the people whose homes are passed by the cable but who are not themselves subscribers would be tempted to sign up if educational programming were offered on pay TV. It is reasonable to assume that the temptation would be even greater if the programming were offered not on pay TV but as part of the regular cable service.

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69. Cable systems have approached 100% penetration only in those places over-the-air reception is extremely poor.
70. Symposium on Urban Cable, pp. 133-142.

Small Audiences for Cablecast Programs

While a significant portion of the community's homes may be connected to the cable, the A.C. Neilsen Company reported that in Middlesex County, Ontario, Canada, it was "unable to find any viewing of measurable proportions of the locally programmed channel."[71] In a 1971 study[72] for the Canadian Department of Communications, Benjamin D. Singer noted the same phenomenon but concluded that "When a special purpose program is to be aired and is well promoted in advance...a special purpose audience will view the program...." Thus, if educators are to use their channel to good advantage they should:

1. Engage in strenuous promotional activity

2. Outline the objectives of the program (Is it public relations or education?)

3. Define the target audience (It doesn't matter if only one per cent of the population watches a series on English language training, for example, if that one per cent constitutes nearly all the non-English speaking people in town.)

4. Devise a feedback and evaluation mechanism so that those programs that meet their objectives can be continued or expanded and those that do not can be revised or discontinued.

Overlapping School Districts and Cable Systems

There are two aspects of the problem of overlap, both of them springing from the fact that school district boundaries are not necessarily the same as those of franchised areas for cable systems. In

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71. Reported in Aspen Notebook, p. 55.
72. Ibid.

one case, more than one cable company may be franchised in a single school district. In the second, more than one school district may be served by a single franchise. In the first instance, the problem may be aggravated if the cable franchises are in different stages of development. Some franchises might be in the negotiation stage, some already in operation. Obviously, the best time to deal with the problem is before any franchises are granted so that interconnection clauses can be part of the agreement.[73] In the second instance, a consortium of users must come to agreement on such matters as allocation of time and sharing of facilities.[74]

Resistance of Teachers to the New Technology

Faculties sometimes resist the introduction of audio-visual technology into the classroom. The fact of this resistance and the reasons for it have been the subjects of countless attitudinal studies and speculative treatises.[75] The 1967 HEW "Summary of Studies" pointed out that research on instructional television has placed great emphasis on assessing attitudes toward using television for the presentation of classroom instruction, saying:

> It is interesting to speculate on the reason for this trend. Perhaps it is because television appears to threaten the

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73. The five cities within the boundaries of the Coast Community College District in Orange County, California, formed a Public Cable Television Authority which, among other things, developed a franchise proposal.

74. Such a consortium exists in Berks County, Pennsylvania, where seven school districts are interconnected.

75. See J. Christopher Reid and Donald W. MacLennan, Research in Instructional Television and Film; Summaries of Studies (Washington, D.C.: Office of Education, Department of HEW, 1967), p. 11.

> position of the classroom teacher, or is perceived as a technological device which will take the human element out of teaching and perhaps result in less effective learning.[76]

Thus, if it is assumed that a) in-school use of television is a good thing, and b) faculty resistance is preventing that good thing from happening, the question arises, "What can be done about it?"

A report by the National Academy of Engineering[77] had the following comment on the matter:

> A principal problem in gaining acceptance of ITV on the campus has been faculty attitudes. Some of them are very negative; a majority do not express strong feelings one way or the other but do not use ITV; and only a small group are willing to actually use ITV. The faculty having ITV experience is more likely to favor its additional use and the trend is toward acceptance by an increasingly larger fraction. This reaction is characteristic of faculty attitudes toward the introduction of any new instructional methods. Time will be required to achieve general faculty approval.

And the "Summary of Studies"[78] remarks that:

> It has been said that "people are often down on things they are not up on." Several studies have indicated that one way of gaining increased faculty acceptance of instructional television is to involve faculty members actively in the planning and conducting of an experiment in the use of television for teaching a course in their own discipline.

In other words, it will take time, and while waiting, educate the educators.

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76. Most studies indicate that faculty resistance is least noticeable in the primary schools and most noticeable in the "prestigious institutions of higher learning."
77. Educational Technology in Higher Education; the Promises and Limitations of ITV and CAI (Washington, D. C.: Instructional Technology Committee, Commission on Education, National Academy of Engineering, 1969), p. 13.
78. Summary of Studies, p. 12.

A model for "educating the educators" is the Instructional Television for Experimental Learning program (ITEL) in Berks and Schuykill Counties, Pennsylvania. One of the major purposes of ITEL is to train teachers to use television as an active tool for teaching and learning. A chronology of how ITEL grew and prospered follows:[79]

1. Winter 1970-spring 1972--"Play-makers" from Berks Intermediate Unit 14, Schuykill Intermediate 20, and Kutztown State College got together and held a series of meetings on cable and education.

2. Spring 1972--Kutztown School District, Reading School District and Berks-Suburban TV Cable joined the discussions. Need was defined: Inservice teacher training on how to use television as an active medium in the learning process. Project was defined: Two series of workshops to meet the need.

3. Summer 1972--Association was enlarged to include Allentown Diocesan Schools, NAACP, YMCA Migrant Program of Reading, and Alternate Media Center of New York University. Planning for second workshop series was constructed. Need was defined: Money. Project was defined: Proposal for Title III Project to encompass Berks and Schuykill Counties. Proposal written and submitted to Pennsylvania Department of Education. Approved in fall 1972. ITEL was born.

4. Fall 1972--First series of workshops held at Kutztown State College. Held on Wednesday evenings for six consecutive weeks, the workshops taught teachers (with little or no experience) how to make classroom videotapes with a simple TV camera and half-inch videotape recorder.

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79. Robert Fina et al., Instructional Television for Experiential Learning, No. 1 (Kutztown State College, Pennsylvania, 1973).

5. Winter 1973--Ten session course, designed by Alternate Media and KSC, given to teachers on use of 1/2" videotape in the classroom, with emphasis on engaging students in use of video to develop curriculum. Recommendation to other districts: make released time, equipment, and facilities available when carrying out similar programs.

The visible results of the ITEL workshops can be seen on the Berks-Suburban cable system, where association members cablecast freely, and in the extensive use of studio facilities at the member schools. One high school has a sophisticated studio which antedates ITEL. Before ITEL, the facilities were rarely used because of lack of interest. After the workshops, where the teachers learned to use simpler equipment, interest in audio-visual techniques increased and the studios are now fully utilized by teachers and students who have "moved up" to higher quality production. As one high school math teacher interviewed by the center said,

> They carried me kicking and screaming to the first workshop. I couldn't see the relevance of TV to the teaching of an abstract subject like mine. I learned. Now the kids in my class prepare one visual project each semester--not necessarily videotape, they can use other media like slides. One semester a group of kids took the video camera out to a field and demonstrated how to apply the mathematical techniques learned in the class to laying out a football gridiron. Someone else did a tape showing geometric forms in nature. The videocamera has got more kids interested in the course and they're learning more. As a bonus, we're keeping the best of the tapes and building up a library of software that can be reused.

Several teachers from several school districts involved in the ITEL project were interviewed and all gave the following advice: A school about to launch a video effort should put what money it has into small roving cameras and half-inch videotape recorders. As many

classrooms as possible should have that equipment. Once the teachers and students become familiar with the instructional advantages of video, the faculty itself will provide the impetus to purchase more sophisticated equipment and to extend the use of the medium.[80]

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80. The "creeping" involvement of the Governor Mifflin Schools with cable television is traced in Appendix E.

FUNDING

Capital and operating budgets

Educators who intend to make use of the local cable system must expect to pay for the effort through the same sources of revenue that support any program--either by tax dollars, endowments or however capital and operating budgets in the respective institutions are obtained. Additional help may be available from other sources, although that help is most likely to be either for start-up costs or for specific programs, rather than long term commitments for general purpose.

Federal funding

The federal funding situation is fluid. It is never clear from one fiscal year to the next how much money will be available, what it can be used for or who will be in charge of any particular program's administration. The education bill signed by the President in December 1973[81] identifies the programs through which cable-related hardware and materials may be bought with federal funds in fiscal year 1974, either as a primary objective of the program or as a means of carrying out the program's purpose.[82] In summary they are as follows:

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81. For additional information see ETV Newsletter, Vol. 7, No. 26, December 24, 1973

82. Additional information is available in the March 1974 issue of American Education. For a copy of that publication write Office of Public Affairs, Office of Education, 400 Maryland Avenue, S.W., Room 2089B, Washington, D.C. 20202.

Table 1. Sources of Federal Funding

Authorizing Legislation	Where to Apply
Equipment & Materials (NDEA III-A)	OE Div. of Library Programs
School Library Resources (ESEA II)	OE Div. of Library Programs
Undergraduate Instructional Equipment (HEA VI-A)	OE Div. of Institutional Support
College Library Resources (HEA II)	OE Div. of Library Programs
Technology & Communications (EHA, II D&F) (Included in Education for the Handicapped)	OE Bureau of Programs for the Handicapped, Div. of Educational Services
Educationally Deprived Children (ESEA I)	OE Div. of Compensatory Education State Education Agencies Bureau of Indian Affairs, Dept. of Interior
Supplementary Centers & Services (ESEA III)	OE Div. of Supplementary Centers and Services; State Education Agencies
Bilingual Education (ESEA VII)	OE Grant Application Center
Impact Aid (SAFAA, P.L. 874 & 815)	HEW Regional Offices
Vocational Education (VEA) (Grants to States)	State Boards of Vocational Education (info. from OE Div. of Vocational and Technical Education)
Adult Education (AEA) (Grants to States)	OE Div. of Adult Education

Drug Abuse Education (DAEA)	OE Div. of Drug Education, Health and Nutrition
Environmental Education (EEA)	OE Div. of Technology and Environmental Education
Right to Read (CRA)	OE Right to Read Office
Emergency School Assistance (ESAA)	HEW Regional Offices OE Office of School Desegregation Programs
Education for the Handicapped (EHA) (Total)	OE Bureau of Programs for the Handicapped, Div. of Educational Services
Fund for the Improvement of Post-secondary Education	OE Fund for the Improvement of Postsecondary Education
Strengthening State Departments of Education (ESEA V)	OE Div. of State Assistance
Follow Through	OE Div. of Follow Through
Special Programs for the Disadvantaged (HEA IV) Talent Search Special Services in College Upward Bound	HEW Regional Offices. OE Div. of Institutional Support
Public Libraries (LSCA I, II & III)	OE Division of Library Programs

Apart from the Office of Education, the National Science Foundation and the National Institutes of Education may be sources of federal support.

State funding

The states themselves provide a substantial amount of support for educational purposes.[83] The departments of education in the individual states are the best source of information about state funding prospects for any single project.

Foundations

Some national foundations have shown an interest in both the development of cable television and the improvement of education. However, foundations do not have unlimited funds and competition for those funds is fierce. While it might be worthwhile to explore the national foundations, it would probably prove more productive to approach locally-based foundations.

Many foundations, both national and local, are interested in specific fields which can be served through the development of educational service delivery via cable. Special purpose foundations have funded programs dealing with health education, post-secondary education for minority groups, etc. If a target audience is congruent with the interests of some of the special purpose foundations, those funding sources should be contacted.

Fund drives

A possible source of funds for both start-up money and general purpose use is the public in general and parents in particular. While usually not prolific money-makers, fund drives can raise necessary supplementary dollars.

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83. For instance, between 20 and 25 per cent of funds spent by all institutions of higher learning comes from state governments.

Industry funding

It is not inconceivable that local industries will help support educational use of cable television. This is most likely to occur for school-to-industry education, as in the models described earlier, or for open circuit programming which relates school to job opportunities.

TO USE OR NOT TO USE

Once all of the necessary information has been gathered--uses that can be made of the cable system; costs; problems likely to occur and how they can be overcome; and sources of available revenue--the decision of whether or not to use the channel remains to be made.

In the case of closed circuit use, the decision is largely dictated by economics. If the present level of instruction can be maintained for less money than is currently being spent, or if the level of instruction can be raised for less than would be spent without cable (assuming that funds for improvement are available), then the cable system should probably be used. Some questions that will help in making these determinations are:

1. Are the schools already wired internally? If not, will the cable operator help defray the expense, either directly or by doing the job at cost?

2. Is there an advantage in being part of the cable system? (For instance, will it extend the range or capacity of an existing ITFS system?)

3. Can the schools be economically interconnected to allow the sharing of special teachers and facilities?

In the case of open circuit use of the system, the decision is dictated not only by cost factors but also by increased audience potential. Will the cable system, in fact, allow the educators to reach new audiences? Factors to consider are:

1. Who is connected to the system?

2. Do the schools have anything to say to these subscribers?

3. If so, can the schools say it attractively enough so that the potential audience will become an actual audience?

The choice is not limited to either closed circuit or open circuit use exclusively. As mentioned earlier, the Reading, Pennsylvania, schools can move from open to closed circuit by merely flipping a switch. If that option is available, the decision to use the system should be made on the basis of the cumulative advantages of closed and open circuits.

The use of cable television by educators can be a great asset not only to the students and faculties of the schools, but to the entire community. Educators should assess the benefits of the variety of possible uses and, if the results of that assessment are positive, the development of procedures and programs should proceed forthwith.

PROCEDURE

The procedure for deciding whether or not to use the system will vary from locality to locality. Initial steps are contingent upon the status of local cable activity. Subsequent steps will be motivated by the data which are developed and the intermediate decisions which have been made.

Status of Local Cable Activity

Pre-franchise stage

Educational authorities should be represented on both the community's general study committee as it prepares to enter franchise negotiations and its education subcommittee. The education

subcommittee should examine the potential uses of a system insofar as they relate to the educational community. At the same time, the subcommittee should make recommendations pertaining to the development of the franchise through its representatives on the general study committee. Cooperation between the two bodies can help to develop a system that can satisfy many educational needs, since it may well be possible to include in the franchise agreement provisions directed toward the development of the educational access channel. These requirements should: 1) provide for the availability of an educational channel if the system is not automatically required to provide it; 2) arrange for the use of the cable operator's equipment and studio; 3) determine the conditions under which educators can use a channel other than the educational access channel; 4) arrange for technical and production assistance by the operator; and 5) provide for closed circuit cable links.

Franchised systems

The existence of a franchised cable system provides less opportunity for negotiation. However, other factors should be kept in mind. If the system still has unused channel capacity available, an operator may possibly see a benefit to expanding system penetration by cooperating with the local educational authorities in developing open circuit educational uses prior to 1977 when the operator must provide the designated access channels. By the same token, the operator may make unused channels available for closed circuit use at minimal or no cost.

Study Tasks

The education subcommittee of a committee to study cable television should undertake specific tasks and submit a final report which makes specific recommendations. A list of those tasks and areas for recommendations follows.

1. Develop background material. Background material should include the names of consultants, a bibliography and, if possible, a list of educational users of other cable systems. The Cable Television Information Center can assist in providing current examples and sources of information. The local operator can also be helpful in familiarizing the study group with equipment and problems associated with developing the educational uses of the system.

2. Assess the demand for open circuit programming in your community. A key question is whether there are enough people connected to the cable to constitute an audience. A system which serves a tiny portion of the population will not make a substantial contribution to the effectiveness of educational programming. The level of penetration that exists should, of course, be compared with the length of time the system has been in existence. If a system is new, growth projections should be made to help in determining the timing of decisions necessary to begin open circuit programming.

If there is an adequate level of penetration, what kind of programming do subscribers want to receive: News of school activities? Community interest programs? Credential oriented courses? There is no

better way to find out than by asking them--by mail, phone, door-to-door or any other available polling technique.

3. Assess the feasibility of closed circuit programming. Can programming plans build upon existing telecommunications facilities such as ITFS or internally wired schools? If the school maintenance staff includes qualified electricians, they can be of inestimable help. This is also an area in which the cable operator can be--and is usually eager to be--of service.

4. Make a survey of available equipment and facilities (coordinate closely with the general study committee). A special survey should be undertaken to pinpoint the location of all available facilities and equipment, including the conditions under which educational authorities may have access to them, and the existing production personnel--including student volunteers.

In the course of searching for facilities and personnel, it may be discovered that the needed resources exist within the community as a whole but not under the rubric of any particular educational entity. It may be possible for schools to share their facilities. Similarly, locally-based government agencies may have valuable resources. Community groups, religious institutions or public television stations may also be sources of equipment and personnel. If such resources do exist in the community, the study committee's report should outline the arrangements necessary to make them available. These arrangements could include loan or lease agreements or even trades in the form of

studio use in return for access to equipment.[84]

5. Determine all costs. Again, this is an area in which the cable operator can assist. The Cable Television Information Center can also be of help here, as can those consultants who will be identified when the background material is developed. A great deal of cost information, and some useful advice about where cost estimates are likely to go wrong, can be gathered from educators who are using other cable systems.

6. Survey the available prerecorded material. Determine whether that material will satisfy local needs better or less expensively than locally produced material can.[85] Check with the state Department of Education. (Some states produce and will supply at little or no charge a wealth of material suitable for either open or closed circuit transmission.)

7. Survey the funding sources available (again, coordinate closely with the general study committee). All potential funding sources should be investigated, including state and federal agencies, foundations, local industry, even local community service organizations. The most likely source for money will be the capital or operating budgets of the school systems themselves. This may mean a shift

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84. See Appendix C for sample facilities surveys.
85. See Appendix D for a list of program sources.

of emphasis in previous budget allocations. Consideration should of course be given to donated services and shared equipment when projecting total costs that will require funding.

8. Define goals of the program and cite the criteria of success in terms of how many and what kind of people to be reached.

9. Set up an evaluation mechanism to measure goals against actuality.

10. Make specific recommendations including the following areas:

--Recommendations for channel management (see pp. 7-8 above).

--Recommendations for consortium of users, if desired (see pp. 5-7, 23-24 above).

--Recommendations for franchise provisions if in pre-franchise or renewal stage (see pp. 8-14 above).

--Recommendations for "What to do with what we've got" if the system is already franchised (see pp. 14-18 above).

--Recommendations on limitations on types of programming--closed or open circuit, community interest, "controversial" (see pp. 19-44 above).

APPENDIX A

MAJOR TELEVISION MARKETS

SUBPART D--CARRIAGE OF TELEVISION BROADCAST SIGNALS[86]

76.51 Major Television Markets[87]

For purposes of the cable television rules, the following is a list of the major television markets and their designated communities:

(a) First fifty major television markets

(1) New York, N.Y.-Linden-Paterson, N.J.
(2) Los Angeles-San Bernardino-Corona-Fontana, Cal.
(3) Chicago, Ill.
(4) Philadelphia, Pa.-Burlington, N.J.
(5) Detroit, Mich.
(6) Boston-Cambridge-Worcester, Mass.
(7) San Francisco-Oakland-San Jose, Cal.
(8) Cleveland-Lorain-Akron, Ohio
(9) Washington, D.C.
(10) Pittsburgh, Pa.
(11) St. Louis, Mo.
(12) Dallas-Fort Worth, Tex.
(13) Minneapolis-St. Paul, Minn.
(14) Baltimore, Md.
(15) Houston, Tex.
(16) Indianapolis-Bloomington, Ind.
(17) Cincinnati, Ohio-Newport, Ky.
(18) Atlanta, Ga.
(19) Hartford-New Haven-New Britain-Waterbury, Conn.
(20) Seattle-Tacoma, Wash.
(21) Miami, Fla.
(22) Kansas City, Mo.
(23) Milwaukee, Wis.
(24) Buffalo, N.Y.
(25) Sacramento-Stockton-Modesto, Cal.
(26) Memphis, Tenn.
(27) Columbus, Ohio

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86. 47 C.F.R. 76.51.
87. A market is described by a 35-mile radius of a predetermined downtown point, and may thus include hundreds of municipalities.

(28) Tampa-St. Petersburg, Fla.
(29) Portland, Ore.
(30) Nashville, Tenn.
(31) New Orleans, La.
(32) Denver, Colo.
(33) Providence, R.I.-New Bedford, Mass.
(34) Albany-Schenectady-Troy, N.Y.
(35) Syracuse, N.Y.
(36) Charleston-Huntington, W. Va.
(37) Kalamazoo-Grand Rapids-Muskegon-Battle Creek, Mich.
(38) Louisville, Ky.
(39) Oklahoma City, Oklahoma
(40) Birmingham, Ala.
(41) Dayton-Kettering, Ohio
(42) Charlotte, N.C.
(43) Phoenix-Mesa, Ariz.
(44) Norfolk-Newport News-Portsmouth-Hampton, Va.
(45) San Antonio, Tex.
(46) Greenville-Spartanburg-Anderson, S.C.-Asheville, N.C.
(47) Greensboro-High Point-Winston-Salem, N.C.
(48) Salt Lake City, Utah
(49) Wilkes-Barre-Scranton, Pa.
(50) Little Rock, Ark.

(b) Second fifty major television markets:

(51) San Diego, Cal.
(52) Toledo, Ohio
(53) Omaha, Neb.
(54) Tulsa, Okla.
(55) Orlando-Daytona Beach, Fla.
(56) Rochester, N.Y.
(57) Harrisburg-Lebanon-Lancaster-York, Pa.
(58) Texarkana, Tex.-Shreveport, La.
(59) Mobile, Ala.-Pensacola, Fla.
(60) Davenport, Iowa-Rock Island-Moline, Ill.
(61) Flint-Bay City-Saginaw, Mich.
(62) Green Bay, Wis.
(63) Richmond-Petersburg, Va.
(64) Springfield-Decatur-Champaign-Jacksonville, Ill.
(65) Cedar Rapids-Waterloo, Iowa
(66) Des Moines-Ames, Iowa
(67) Wichita-Hutchinson, Kan.
(68) Jacksonville, Fla.
(69) Cape Girardeau, Mo.-Paducah, Ky.-Harrisburg, Ill.
(70) Roanoke-Lynchburg, Va.
(71) Knoxville, Tenn.
(72) Fresno, Cal.
(73) Raleigh-Durham, N.C.

(74) Johnstown-Altoona, Pa.
(75) Portland-Poland Spring, Me.
(76) Spokane, Wash.
(77) Jackson, Miss.
(78) Chattanooga, Tenn.
(79) Youngstown, Ohio
(80) South Bend-Elkhart, Ind.
(81) Albuquerque, N. Mex.
(82) Fort Wayne-Roanoke, Ind.
(83) Peoria, Ill.
(84) Greenville-Washington-New Bern, N.C.
(85) Sioux Falls-Mitchell, S.D.
(86) Evansville, Ind.
(87) Baton Rouge, La.
(88) Beaumont-Port Arthur, Texas
(89) Duluth-Superior, Minn.
(90) Wheeling, W. Va.-Steubenville, Ohio
(91) Lincoln-Hastings-Kearney, Neb.
(92) Lansing-Onondaga, Mich.
(93) Madison, Wis.
(94) Columbus, Ga.
(95) Amarillo, Tex.
(96) Huntsville-Decatur, Ala.
(97) Rockford-Freeport, Ill.
(98) Fargo-Grand Forks-Valley City, N.D.
(99) Monroe, La.-El Dorado, Ark.
(100) Columbia, S.C.

APPENDIX B

THE "BLUE SKY" OF EDUCATION

There are many educational applications of cable which depend upon two-way systems for their realization. There are also a number of more exotic ideas which are impractical on any foreseeable system. Discussions of cable in recent years have aroused such high expectations for some of these possibilities without distinguishing the real from the unreal that it is worth exploring a few of them here.

Dial Access Programming

Dial access programming refers to a system in which individual subscribers can choose programs from a catalogue and order them up by dialing or punching the appropriate identification number on a remote terminal. Such random access--or as it is sometimes called, "on-demand programming," or the "video juke box"--has obvious implications for education as well as for entertainment.

Unfortunately, implementation of such systems on a large scale is not practical. A central library of 50 programs would require 50 channels devoted to just that service. If one channel were devoted to dial access, one person dialing a program would clog the system, preventing any other subscriber from seeing a program until the first one was finished. Even someone wanting to see the same program would have to join it in progress unless it were dialed at the same time. A system with two channels is clogged when two subscribers order different programs and so on. Ultimately, as many channels are needed as there are programs or, programs allowed as

there are channels.

A practical system can be devised if a limited number of receiving points each has its own multi-channel cable to the central playback point. For example, if each of the schools in a district had a thirty channel cable to a central library, up to 30 classrooms in each school could view different programs at the same time on a dial-up basis. The problems would still be formidable, however. This arrangement would require a playback machine at the central point for every program in the library if each program were to be available on a demand basis. This might represent a staggering cost in equipment, operation and maintenance.

A more economical compromise away from a truly on-demand random access system is possible, such as having teachers notify the library of their program needs in advance. This would require only enough playback equipment to cover actual demand, rather than one machine for every program in the library. Still, the costs and benefits of such a system must be compared to the alternatives of having either playback machines on roll-around carts within each school or local libraries of tapes or a central library from which tapes can be ordered and delivered to the schools on a daily basis.[88]

Interactive (Two-way) Instructional Television

Students may interact with a remote classroom by audio, audio and video or data. There have been only a few experiments with these forms of interaction on existing cable systems, but there is considerable experience

88. Maris Gailistic, The Costs of Information Retrieval Systems. A Case Study in the Cost-Effectiveness of Educational Media, Occasional Papers No. 12. (Toronto: The Ontario Institute for Studies in Education, 1972).

with them in closed circuit campus systems and on ITFS microwave systems.

The Stanford Instructional Television network operated by Stanford University mentioned earlier beams televised classes to participating companies in the San Francisco Bay area via ITFS. Employees of these companies may take courses for undergraduate or graduate credit. The remote classrooms are equipped with a return audio capability which enables all students to participate fully in all class discussions.[89]

Such a system is adaptable to conventional cable systems only if a provision is made for a separate return audio link. In the Stanford network, return audio is transmitted by FM radio in a portion of the ITFS band not used for television transmission. A similar arrangement could presumably be made for a cable-based network. Another alternative (although expensive) would be to use leased telephone lines from the remote classrooms.

In either case, cable would only substitute for ITFS broadcast and would have no particular advantage over it unless the cable system provided the same number of channels free of charge. ITFS assignments generally come in groups of four channels per licensee and have a greater area of coverage than most cable systems. However, there is an economy with cable systems on the receiving end. A cable drop is less expensive than an ITFS receiver.

Two-way cable systems could provide the same kind of service as the Stanford network, i.e., one-way video and two-way audio, but only to a limited number of subscribers. A televised class could be transmitted

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89. Pettit and Grace, "The Stanford Instructional Television Network."

throughout the general system, but only a limited number of receiving points--preferably classrooms--could feasibly use the talkback feature. One reason is the cost of placing the required microphones and modulators in private homes; but a greater limitation is the number of remote points that could participate in a class discussion before overwhelming the teacher and other students.

Return video from individual students or remote classrooms represents the same general kinds of difficulties as does return audio. One surprising difference, though, is that two-way video is easier to accomplish on cable than on over-the-air systems such as ITFS. The difference stems from the greater channel capacity of cable and its greater facility for remote control from the central classroom. An example might make this clearer. In Overland Park, Kansas, two homebound children were taught on a two-way cable system developed by the Telecable Corporation of Overland Park. Each child in the experiment was provided with a television camera, microphone and signalling buttons to let the teacher know when they wanted to talk and be seen. Each of the two homes was equipped with a modulator and transmitter which, in effect, permitted them to "broadcast" on a given channel. Normally, upstream video from multiple sources consumes too many channels to be considered for general use. However, a controlled situation such as a class, in which the teacher directs traffic, utilizes a principle called time sharing in order to obtain nearly the same benefit from a single channel.

In the Overland Park experiment both participating households transmitted upstream on the same channel, but not at the same time. When one of the pupils signalled a wish to be on, the teacher could remotely switch the system to that input. At any given time, the teacher could control whether

her camera or the camera of either of the two pupils would appear on all screens. In that way the students saw not only the teacher but each other as well. The same principle could be extended to any manageable number of homebound students in a single class. Since each class would use only one upstream channel, the limitation on the number of classes would be that of the number of available upstream video channels. In large population centers this could be a serious limitation. The cost of cameras and modulators would also represent a constraint. Utilization could be improved by reserving most of the upstream video channels for remote classrooms rather than individuals. One channel might be reserved for seriously handicapped persons who could not leave their homes, but the bulk of the upstream video capacity would be better employed for institutional use.

Digital or data response is another form of remote student interaction which has received considerable attention in cable literature. Interest about it stems from the fact that two-way cable systems can accommodate this kind of return communication in great volume. Return video is feasible from a handful of remote points; return audio from perhaps a few score; and return data or digital messages can be gathered and tabulated from thousands of remote terminals. A problem, however, is that there is no way for a teacher giving a televised class to manage this volume of responses in anything but an aggregate form. Applications have been suggested which could make use of aggregated information. A teacher might ask at some point in the lecture, for example, if everyone had understood the last point. Viewers could then register a "yes" or "no" response. A computer readout in the classroom would indicate the number of those who understood and the number who did not. Based upon this information, the teacher could

try again or proceed with the next point. Another way to accomplish the same goal is for the teacher to frame a few questions in multiple choice form. From the totalized answers, it would be possible to determine how to proceed. Digital responses here are considered in relation to televised live instruction. The use of digital communication in computer assisted instruction will be considered in the following paragraphs.

Computer Assisted Instruction[90]

Machine assisted teaching is some 40 to 50 years old, but only in the last decade has the power of the digital computer been applied to education on a systematic basis.

CAI is still evolving, both in techniques and in educational objectives, and there is much debate both as to its cost effectiveness and also the results achieved. Without attempting a judgment in these two areas, CAI nevertheless is especially compatible with cable communications. CAI implies a centralized computer, with communications links to a number of remote locations; and a cable system can provide both the geographical coverage and adequate channel capacity needed.

In its present form, CAI includes a computer and a library of instructional programs. Students at any location are equipped with an input-output terminal (usually a standard teleprinter because of its relatively low cost) that can communicate with the computer. Through this terminal, the student can receive instructional assistance in a variety of ways. The simplest is

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90. The discussion of computer assisted instruction is taken from the center publication, The Uses of Cable Communications.

"drill-and-practice." Here the computer presents exercises, in increasing order of difficulty, to the student, testing the answers at each step. More complex forms of CAI may involve simulation in which the computer is used to set up a model of a situation (e.g., a business enterprise), and the student works with this model. Another CAI technique is for the student to use the computer--rather than a textbook--as a tool in problem solving, with each student working at an individual pace.

An example of CAI in operation is the University of Illinois' PLATO system (Programmed Logic for Automatic Teaching Operations), which has been evolving since 1961. In 1962-63, the system consisted of two terminals time-sharing a Control Data Corp. "1604" computer. This was expanded in 1964 to the PLATO III configuration, featuring a computer classroom of 20 graphic/pictorial terminals.

Some of the subjects for which CAI courses were developed for PLATO include electrical engineering, geometry, biology, nursing, library science, pharmacology, chemistry, algebra, computer programming and foreign languages. More than 100,000 student-terminal-hours, much of this for academic credit, have been logged on the PLATO III system.

PLATO III costs have ranged from $2 to $3 per student-terminal-hour, which is about in the middle of experienced CAI costs in general (estimated at $1.50 to $5.00). This contrasts with about $.25 to $.50 per student hour for conventional instructional costs in elementary schools.

Because of this higher cost, PLATO IV has been developed to more nearly approximate conventional costs. The principal features of PLATO IV are:

--The design of a novel student terminal, utilizing a plasma display panel.

--The use of a large-scale computer to achieve economies of scale, designed to serve up to 4,000 student stations and teach several hundred lessons simultaneously.

--Communications capability to within a 150-mile radius of the computer center. (This is more than adequate for most cable systems if the computer is located in or near the franchise area.)

The key item is the plasma terminal designed to combine high performance and low cost. Its concept can be likened to a display sign made of thousands of incandescent light bulbs. The plasma panel is transparent, allowing other optically projected images to be projected on the matrix image. Thus, any combination of photographic and graphical material can be displayed. This permits combining a microfilm and computer-based system, providing a wide range of visual, graphic and alphanumeric capability.

The following figure shows the projected costs of PLATO IV, achieving an objective of $.34 per student-terminal-hour, which compares favorably with conventional instruction.

PLATO IV is obviously a large-scale system, requiring a sizable student base to achieve its economies. For smaller systems, the costs may be difficult to justify.

Table 2. Projected Costs--PLATO IV

Item	Total Cost (Million $)	Cost/Year (5 Year Period) (Million $)	Cost Per Student Terminal Hour* (Cents)
Computer system	4.5	0.9	9
Software	1.5	0.3	3
Student terminals ($1,800 each)	7.5	1.5	15
	13.5	2.7	27
Lesson material			3
Communications			4
		Total	34¢

* Usage assumed at 10 million student-terminal-hours per year.

As might be expected, the software library necessary for effective CAI represents a major expenditure of time and manpower, in many cases greater than the equipment cost. Preparation of a single course in acceptable CAI form can easily cost $25,000 to $100,000 or more.

Nevertheless, many schools and educators who have worked with CAI claim that these costs can be justified on the basis of improved learning and also reduced instructional costs once the software has become operational.

The main advantage a cable system offers to CAI is a lower cost for the communications link. For the PLATO IV system, where the figure indicates communications costs at only four cents per student-terminal-hour, this may not seem significant. Most other CAI applications to date, however, use telephone circuits, with high monthly costs. If a cable is connected between two schools, for example, a voice-frequency link can be made available at a fraction of the cost of a commercial phone line circuit.

Such inter-school links, capable of data communications, might also be used for educational record keeping, accounting and management functions. In theory, pupil records, for example, could be stored at one location for an entire school district and updated through terminals and communications links. This, of course, would require procedural changes that many communities may be reluctant to implement, but the possibility for effecting economies remains.

APPENDIX C

FACILITIES AND EQUIPMENT SURVEYS

EXHIBIT 1. THE SAN GABRIEL VALLEY PUBLIC CABLE COUNCIL SURVEY OF PROGRAM PRODUCTION AND UTILIZATION CAPABILITY

The purpose of this questionnaire is to determine facilities and equipment that ach city, school district or community organization has for producing and viewing ideotaped programs.

IF YOU DO NOT OWN THE EQUIPMENT - BUT HAVE ACCESS - PLEASE PLACE HECKMARK (√) AFTER THE ITEM AND INDICATE, ON THE REVERSE SIDE OF THE ORM, WHO OWNS THE EQUIPMENT AND WHERE IT IS LOCATED.

Date_____

ame of city, school district or community organization_____

nventory taken by_____ Phone_____ (ext.)

. A videotape recorder which can record and/or play back programs previously ecorded.

(a) 2-inch helical videotape recorders

_____/_____ _____/_____
(Quantity) (Make & model) (Quantity) (Make & model)

(b) 2-inch quad videotape recorders

_____/_____ Check if: ___B&W __Loband color __Hiband color
(Quantity) (Make & model)

_____/_____ Check if: ___B&W __Loband color __Hiband color
(Quantity) (Make & model)

(c) 1-inch videotape recorders

_____/_____/____/____/_____/_____/____/____
(Quantity) (Make & model) (B&W) (Color) (Quantity) (Make & model) (B&W) (Color)

(d) Half-inch videotape recorders

_____/_____/_____
(Quantity of AV) (Quantity of EIAJ-B&W) (Quantity of EIAJ-color)

Monitors (television sets) which can be connected to the playback recorder in order at the videotapes may be displayed to a group of people gathered to watch the program.

(a) Color monitors _____/_____
(Quantity) (Size)

(b) B&W monitors _____/_____
(Quantity) (Size)

Please indicate the item and the number of the question which you are referring to.

Item	Question	Owned by	Location

TV cameras and microphones which can be attached to videotape recorders to record videotape

(a) Number of: _____ / _____ / _____ / _____ / _____ / _____
(Live TV cameras) (B&W) (Color) (Vidicon) (Plumbicon) (I.O)

(b) Number of: _____ / _____ / _____ / _____ / _____ / _____
(TV film chains) (B&W) (Color) (16mm) (Super 8) (35mm)

(c) Number of microphones: _____

. Do you have a closed circuit system to view programs in different areas?

___Yes ___No Is there more than one system? ___ _____

. Studio facilities (capability of mixing two or more cameras and audio mixing into the programming).

(a) Studio size in square feet _____

(b) Number of production hours available for programming _____ / _____
(per day) (per week)

. Film making capabilities

(a) Number of film cameras _____ / _____ / _____ / _____
(16mm) (8mm) (Super 8) (35mm)

. Quantity and type of movie editing equipment _____ / _____
(Quantity) (Describe type)

. Do you have a staff photographer? ___Yes ___No _____ / _____ / _____
(full time) (part time) (as needed)

. Do you have a photo lab to process your own film? ___Yes ___No

(a) _____ or _____
(still photo film) (movie film)

OMMENTS _____

_____

Thank you.

In order that we may tabulate these survey forms by September 15, 1972, please omplete at your earliest convenience and return to my office. If you have any ques- ons regarding the questionnaire please contact Dr. Riess at 795-6961, ext. 450.

PLEASE RETURN COMPLETED QUESTIONNAIRE TO:

Dr. Louis C. Riess, Council Coordinator
Pasadena City College
1570 E. Colorado Boulevard
Pasadena, CA 91106

EXHIBIT 2. ARLINGTON CATV TASK FORCE SURVEY

FALL 1973

Name _____ Position _____

Institution _____

Address _____ Zip code _____ Area code _____ Phone _____

1. Is equipment loaned to other departments within the institution? Outside the institution?

2. What equipment is most utilized? What equipment is underutilized?

3. How large is your audiovisual department staff? Do you have production crews for film? Do you have production crews for videotape?

4. Do you rent equipment from other institutions or agencies? From whom do you most often rent?

5. Do you rent equipment to other institutions? Under what circumstances?

6. What kinds of equipment do you wish to acquire or have access to, which you do not currently have?

7. Would you be willing to exchange access to equipment with other agencies?

8. Would your organization be willing to work with other institutions on joint production of software? What kinds of projects would you be interested in seeing co-produced?

9. Additional comments, suggestions:

VIDEOTAPE	tape format	quantity	color/b&w	edit	make	model
Recorders						
Cameras						
Monitors						
Switchers						

CONTROL ROOM (Briefly describe studio and control facilities)
AND STUDIO

Thanks for your cooperation and help. We will compile this information as soon as you return the questionnaires.

Please send to: Norman Kaderlan, Performing Arts, Arlington County Recreation Division, 300 N. Park Drive, Arlington, Virginia 22205

APPENDIX D

PROGRAM SOURCES[91]

The following is a list of distributors of tapes and/or films which may be suitable for the educational access channel. While every source listed distributes some material which has been copyright-cleared for cable distribution, not all material available from every listed source has been so cleared. In most cases, the only way to find out if the particular material is cleared for cable use is to write for the distributor's catalogs and then make further inquiry about particular tapes or films.

One of the sources listed, the National Audiovisual Center, distributes a catalog of all films and tapes available from the United States government.

The sources listed distribute material covering a wide range of subjects, including both in-school audio-visual lessons and such nonacademic topics as card sharkery, the "energy crisis" and the metric system. Because most distributors do not specialize in particular subjects, it has not been possible here to specify the material available from the individual sources, except where noted.

Column One on the following chart identifies the source. Columns Two, Three and Four indicate whether the material is available for rent, for purchase or for the asking. Column Four, headed "Advertiser Sponsored," indicates whether or not the material contains commercial advertising.

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91. The discussion of program sources is based on Local Government Uses of Cable Television (Washington, D.C.: Cable Television Information Center, 1974).

BEST COPY AVAILABLE

Program Source	Rental	Sale	Free	Advertiser Sponsored
Alternate Media Center 144 Bleecker St. New York, New York 10012			√	NO
American Diversified Services Box 975 Kingsport, Tennessee 37622	√			NO
American Enterprise Institute for Public Policy Research 1428 Wisconsin Ave. Washington, D.C. 20007 (Public affairs material)			√	NO
American Video Network, Inc. P.O. Box 1 Eau Claire, Wisconsin 54701 (Health Care & Education)	√	√		MANY
Association-Sterling Films 43 W. 61st St. New York, New York 10023			√	MOST
BFA Educational Media 2211 Michigan Avenue Santa Monica, Calif. 90404	√	√		SOME
BNA Films 5615 Fisher Lane Rockville, Maryland 20852	√	√		NO
Broadside TV Videomaker 204 E. Watauga Johnson City, Tennessee 37601 ("Appalachia's Living Newsletter")		√		NO

BEST COPY AVAILABLE

Program Source	Rental	Sale	Free	Advertiser Sponsored
Campus Film Productions (Distribution Center) 20 E. 46th St. New York, New York 10017	√			SOME
CAT Video 675 South University Blvd. Denver, Colorado 80209 (Distributes Time-Life "Foods of the World")			√	YES
Classroom World Productions 22 Glenwood Ave. Raleigh, North Carolina 27606	√	√		NO
Contemporary/McGraw-Hill Films 330 W. 42nd St. New York, New York 10036	√			MANY
Encyclopedia Britannica 425 N. Michigan Ave. Chicago, Illinois 60611	√			NO
Great Plains National Instructional Television Library Box 80669 Lincoln, Nebraska	√	√		NO
Independent Television Corp. 555 Madison Ave. New York, New York 10022	√			NO
KVST-TV 1136 N. Highland Ave. Hollywood, California 90038 (Supplies list of distributors rather than catalog)	√			MANY

BEST COPY AVAILABLE

Program Source	Rental	Sale	Free	Advertiser Sponsored
Media Buffs-Videofreex Maple Tree Farm Laneville, New York 12450		√		SOME
Modern Talking Pictures 1212 Avenue of the Americas New York, New York 10036	√		√	SOME
National Audio-Visual Center National Archives and Records Service (GSA) Washington, D.C. 20409	√	√		MANY
National Filmboard of Canada 690 Fifth Ave. New York, New York 10019	√			NO
National Instructional Television Center Box A Bloomington, Indiana 47401	√			NO
Pictura Films Distribution Corporation 43 W. 16th St. New York, New York 10011	√	√		NO
Pyramid Films 2801 Colorado Ave. Santa Monica, California 90404	√	√		MANY
Stephen Bosustow Productions 1649 Eleventh St. Santa Monica, California 90404	√			SOME

COPY AVAILABLE

Program Source	Rental	Sale	Free	Advertiser Sponsored
Spokane Community College W3410 Fort George Wright Drive Spokane, Washington 99204 (High School Equivalency Test Preparation)	√	√		NO
Sportlite 20 N. Wacker Drive Chicago, Illinois 60606 (Most but not all are sports films)	√	√		MANY
Telecine Films 111 Euclid Park Ridge, Illinois 60068 (Includes vocational guidance)	√	√		NO
Telemedia, Inc. 3320 Kemper St., Suite 102 San Diego, California 92110	√			MANY
Tricontinental Film Center 244 W. 27th St. New York, New York 10001 (Distributes films from and about South America and Africa)	√			MANY
United Methodist Communications P.O. Box 871 Nashville, Tennessee 37202	√	√		NO
Videotape Networks 115 E. 62nd St. New York, New York 10022	√		√	NO

BEST COPY AVAILABLE

Program Source	Rental	Sale	Free	Advertiser Sponsored
Visual Instruction Production 295 W. 4th St. New York, New York 10014	√		√	SOME
Western Instructional Television, Inc. 1549 N. Vine St. Los Angeles, California 90028 (Series films)	√	√		NO

APPENDIX E

THE GOVERNOR MIFFLIN SCHOOLS

The Governor Mifflin Schools, in Berks County, Pennsylvania, have had a long acquaintanceship with communications media. The system has continuously produced a radio show for nearly thirty years. In the late 1960's, a congruence of factors set the school administration thinking about a system-wide involvement with television.

First, several of the schools had been wired for closed circuit uses and those schools had already "gotten their feet wet" in the use of audio-visual materials. Second, the area's cable company, Berks TV Cable (part of the American Television & Communications Corp. chain), had approached the schools with the suggestion that they use the cable and had offered technical assistance and cable at cost. Third, the schools had on their staff an electrician who was qualified to do much of the work. And fourth, NDEA funds were available.

In 1970, the decision to enter television was taken and William Kline was appointed audio-visual coordinator. The following outline, supplied by Kline, traces the steps that Governor Mifflin took from 1970 to the present.

I. Planning Ahead. 1970-1971

A. Position of Audio-Visual Coordinator created.

B. NDEA funds used to purchase the following:

1. Two one-inch Ampex Videotape Recorders VPR 5800 (@ $4,650)

2. Thirty-five RCA Monochrome 21" Receiver Monitors (@ $144)

3. Catel Channel 6 Midband Modulator ($700)

4. Fifty hours of 3M brand one-inch videotape (@ $32)

II. Getting Started and Using What We Had. 1971-1972

A. Program initiated at junior high school. Building already had a closed circuit system which distributed off-air signals to the classrooms. The cable company tested and connected the system to the cable. The CCTV system had one channel, which meant that when that channel was used for closed circuit purposes, normal cable service had to be cut off.

1. Staff was prepared for the program. Voluntary participation by the departments was encouraged.

2. Videotapes (one-inch) obtained from Pennsylvania Department of Education, Bureau of Instructional Media Services.

B. Purchases made with NDEA Title III and ESGA Title III funds.

1. Eighty additional RCA Monochrome Receiver Monitors (@ $140)

2. Two Portapak systems (@ $1,550)

3. Three half-inch TV recorders (@ $1,550)

4. Studio quality monochrome TV camera with lens, tripod ($1,650)

5. 15 converters for midband reception (@ $35)

6. Catel Channel 6 modulator ($700)

7. Two RCA Color Receiver Monitors (@ $400)

C. Building modifications: four elementary schools had closed circuit systems installed. Cable company furnished cable at cost. Per-room costs varied from less than $25.00 per room for a school wired over the summer by professionally supervised college students to over $35 per room in school wired by the school system's maintenance staff with much of the work done on overtime pay scale.

D. Junior high system became two channel. School could now use closed circuit system without turning off normal cable reception.

E. The first programming--a monthly information show--went out over the cable. Cable company's facilities were used.

III. Expanding the Program, Getting the Kids Involved, and More Programming. 1972-1973.

A. First student summer school TV workshop.

B. Intermediate school "Summer Happening" cablecast by student-staff crew using Portapak.

C. Sixteen winter sports events (basketball, wrestling) done "live" with single camera, student crews, using Channel 4 modulator borrowed from the cable company. School could now use "blacked out" time on imported station. Berks TV Cable installed the "upstream" line from the high school gym.

D. Junior high school connected by the main cable to the high school and education center by the main cable, making all three buildings part of the same closed circuit system. The high school and education center now able to use midband channels.

E. District monthly show continued but now taped at the school.

F. Two more elementary schools wired internally and connected to the cable system. No mid-band reception possible.

G. One elementary school, not in cable company's service area, wired internally. Now capable of distributing off-air signals to all classrooms. Can also distribute videotapes "bicycled" from the rest of the system.

H. Purchases (No NDEA funds available)

1. Scientific Atlanta Channel 4 modulator ($1,050)

2. Four additional converters (@ $37.50)

3. 120 rolls of half-inch videotape (@ $18)

4. One studio camera (Sony AV-4600) with tripod-dolly ($1,350)

5. Sony camera switcher fader--S.E.G. 2 ($700)

6. Sony camera junction box 5B-3 ($200)

IV. More Expansion and Some Opportunities. June-December 1973.

A. Enrollment and curriculum changes make a pre-fab classroom available at the junior high--turned into a primitive, movable studio.

B. Programming via cable continues and increases

1. Monthly show "Community Report" continues

2. Winter sports schedule continued

3. "GM Update," a district news program, cablecast bi-weekly using student crews and announcers. Junior and senior high alternate.

4. Various specials done live or taped.

5. All but two of the school buildings interconnected by the main cable.

C. First attempts at local production of classroom videotapes--geography, intermediate level, ISCS Science, junior high music, junior high related arts

D. Second summer school workshops held in basic TV for junior high students, advanced TV workshop for kids previously in program. Most programming done when qualified kids are available without interrupting normal school classroom program

E. Modifications made to existing district system

1. Closed circuit system installed at another elementary school. Done by school maintenance staff during regular school time.

2. TV room interconnected to control room.

3. Junior high gymnasium connected to TV control room

4. Return line to cable company distribution center from TV control room (junior high) installed by cable company

5. Control room patch panel modified to include new functions

F. Most important additional function is that now "live" and taped programs can come directly via the TV control room (junior high) and go throughout the entire system served by the cable company.

APPENDIX F

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